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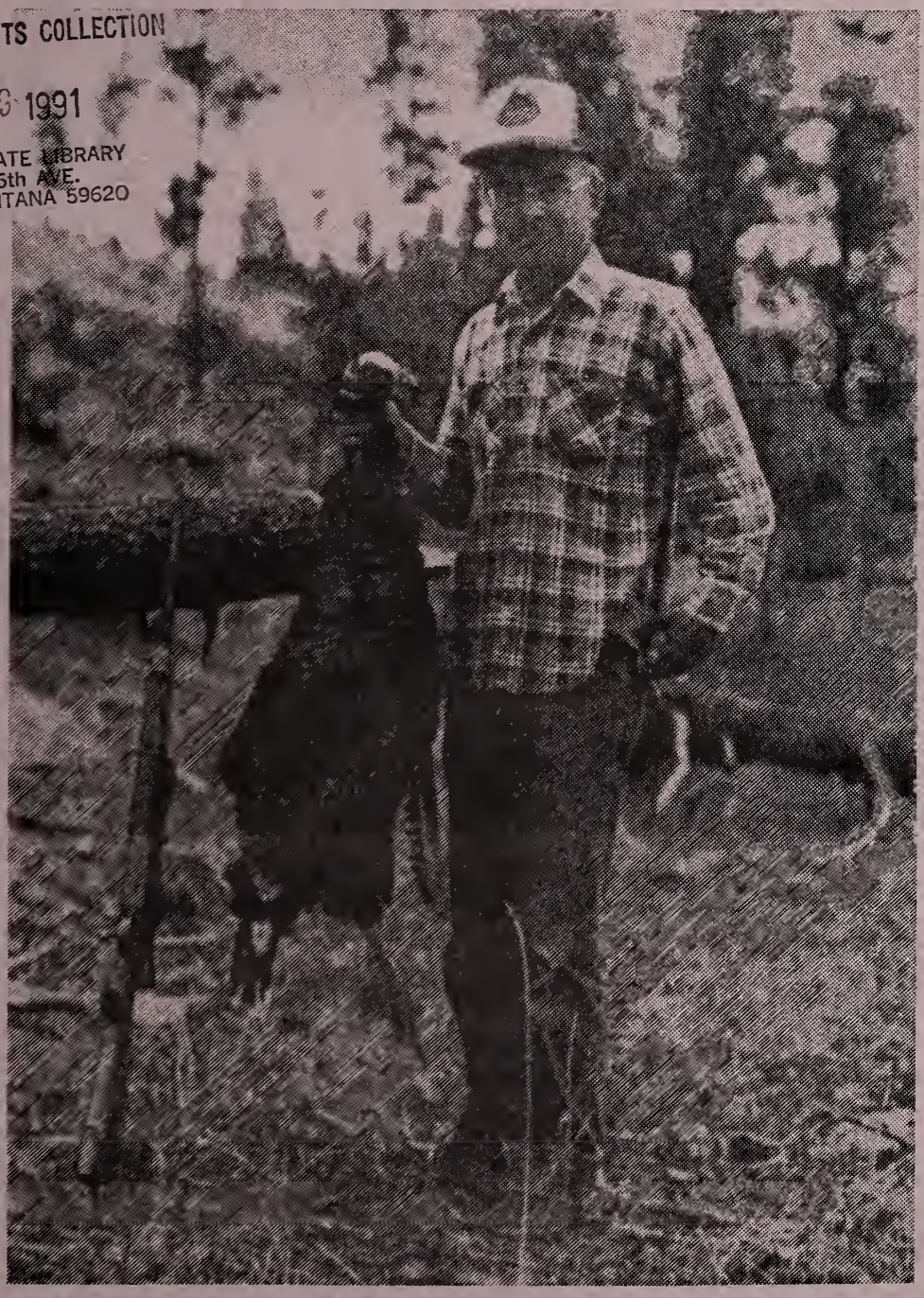

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February, 1991

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UPLAND GAME BIRD HARVEST MANAGEMENT

IN MONTANA

A Report to the Montana Fish and Game Commission

February, 1991

DEDICATION

This report is dedicated to the memory of C. Robert "Bob" Watts, who served as Regional Wildlife Biologist for the Department of Fish, Wildlife, and Parks from 1969 to 1990. Although Bob was responsible for management of all wildlife species in the Lewistown district, he was particularly dedicated to the study and management of upland game birds. They were a big part of his life; a big part of who he was. Much of Montana's upland game bird picture in 1990 has been painted by Bob Watts, who invested many years in pursuit of answers to questions about bird biology and the effects of harvest on those populations. The result is that Montana now has one of the most enlightened and progressive upland game bird programs in the United States. It is fitting that this report which documents the background for that program recognizes Bob's significant contribution to it.

ACKNOWLEDGMENTS

This report was prepared through the combined efforts and insight of the Regional Wildlife Managers, Assistant Managers, Regional Wildlife Biologists, the Research and Technical Services staff of the Department of Fish, Wildlife and Parks and the Helena Wildlife Division Staff. Dr. Robert Eng of Montana State University also provided valuable insights.

INTRODUCTION

At its January, 1990 meeting, the Montana Fish and Game Commission (the Commission) discussed the need for a comprehensive report on the information and processes which go into the annual process of establishing upland game bird hunting regulations in Montana. The primary considerations in that process are outlined below as well as an overview of changes in attitudes and recommended regulations over time.

This report includes a References section which provides results of research studies and surveys, biological principles and philosophies guiding the Department of Fish, Wildlife, and Parks (the Department) recommendations. Readers who want to become better informed on this subject should refer to these references.

UPLAND GAME BIRD ACTIVITIES CONDUCTED BY THE DEPARTMENT

The Department is currently involved in eleven major activities which comprise its upland game bird management program. Four of these, the statewide harvest survey, the hunter preference survey, the hunter wing collection survey, and the annual regulations setting process, relate specifically to harvest and public use of the upland bird resource. The Department also conducts two major population surveys, pheasant crowing count routes and prairie grouse lek surveys.

Other Department upland bird activities include: implementing the Upland Game Bird Habitat Enhancement Program (UGBHEP); trapping, transplanting, and evaluating the population status of turkey populations around the state; the pheasant stocking program as authorized by Senate Bill 33 (Montana Legislature 1987), and a variety of activities for providing the public with information on upland game birds.

This report will address only the first six of the listed activities, those that deal with public use of the upland bird resource and estimation of bird populations.

Public use of the upland bird resource has traditionally been primarily for hunting. Hunting in turn has evolved from primarily a meat-gathering activity to a recreational pursuit. Recently an increasing number of Montana residents and nonresidents are making use of the upland bird resource for nonconsumptive purposes including photography, bird-watching, and viewing.

The Department's Research and Technical Services Bureau is currently analyzing the results of a statewide hunter preference survey for upland game birds, the results of which will give further guidance to the Commission relative to public needs and perceptions about the upland bird program. The results were not available for consideration before production of this report.

Hunter use of Montana's upland game bird resource is monitored through the statewide hunter harvest survey, the wing collection survey, and hunter checking stations. The hunter harvest survey consists of a sample of bird license holders who are contacted following the hunting season by telephone interviewers to determine the numbers and kinds of birds taken, areas hunted, and effort expended in hunting birds. Prior to 1982, harvest data were gathered through questionnaires mailed to hunters following the hunting season (Haskins, Pers. comm.)

The upland bird wing collection survey is designed to accumulate a large sample of wings taken by upland game bird hunters as a result of that year's hunting effort. Wings are collected at hunter check stations, directly from hunters at their homes or at department offices, and through a mail-out of prepaid envelopes to known bird

license holders. These wings are then sorted by age, by sex (if possible) sex and by species for each region and statewide. These data are used primarily as a measure of the success of that year's breeding effort, although Knapp (Pers.comm.) and others have used hatching dates determined from wings in decision-making relative to land use issues.

Check stations have been conducted in some regions of the state since the late 1940s. Although checking a portion of wings from birds harvested is the major objective of these check stations, hunter contacts to determine effort expended, numbers of birds seen, availability of hunting on private lands, and other aspects of the hunt are discussed with hunters.

Regulations recommendations from the Department are formulated during the winter months following the hunting seasons. In each region, the Wildlife Manager and his staff discuss their recommendations and then forward them to the Regional Supervisor who will discuss them at a regional meeting held before the March meeting of the Commission. At that meeting the Commission will also discuss public comments received by them on the proposed regulations which are mailed out to interested individuals and organizations in early January.

Season dates are currently set by the Commission for two years at a time, most recently at their January, 1990 meeting. Other regulations pertaining to daily bag and possession limits, areas open to hunting, means of taking, etc. are finalized by the Commission at their March meeting. In 1991, this meeting is scheduled for March 8.

Primary population surveys conducted for upland birds are for sharp-tailed grouse (sharptails), sage grouse and ring-necked pheasants (pheasants). In a few regions there are also intermittent surveys conducted to census some winter or spring turkey populations.

Pheasants are currently being surveyed in most regions using roadside censuses of crowing males, a technique described by Weigand and Janson (1976). Sharptails and sage grouse are also surveyed in most regions by locating communal breeding display grounds or "leks" and counting the number of males present on these grounds. Both of these surveys are used as indexes to spring population size of these three species.

There currently are no organized population surveys for any other species of resident upland game birds in Montana. Mourning doves (doves), a migratory upland game bird, are surveyed on 25 roadside trend routes in Montana as part of a nationwide population trend survey conducted by the U. S. Fish and Wildlife Service. Department personnel cooperate on seven of these survey routes.

Several surveys for upland game birds have been discontinued. From 1942-1949, Department personnel conducted roadside surveys for forest grouse to determine their distribution and relative occurrence in a variety of habitat areas in western Montana (Mussehl et al. 1971). The Department during the 1970s and 1980s also conducted and participated with the U. S. Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) in locating and counting upland game bird broods. Winter surveys of pheasants to determine sex ratios have also been conducted.

SPECIES CONSIDERED IN THIS REPORT

This report will discuss the Department's management program for eleven species of upland birds. These include three native mountain grouse (blue, ruffed, and spruce grouse); two native prairie grouse species (sharp-tailed and sage grouse); three exotic species introduced into the United States (ring-necked pheasants, hungarian partridge, and chukar partridge); one species native to the U.S. but introduced into Montana (Merriam's turkey); and two species of migratory shore and upland game birds (mourning doves and common snipe).

Discussion of individual species or groups of these species in this report will center around: population estimation; hunting seasons (length, opening and closing dates); limits (daily bag and possession); trends in harvest and hunter activity; and special considerations (sex restrictions, means of taking, and others).

In addition, general relationships to be discussed in this report will include: the effect of regulations on harvest; the effect of harvest on populations; the Department's mission in upland bird management; hunter satisfaction, expectations, and needs; the need for consistency in regulations; the effect of habitat change on appropriateness of harvest management; landowner tolerance and expectations relative to regulatory issues; and overharvest.

MOUNTAIN GROUSE

Population Estimation: At the present time, no population surveys are done by the Department. The wing collection survey initiated in 1959 (Mussehl et al. 1971) as well as check station activities initiated in 1949 are the primary indications managers have of the status of these populations. These data sources are after-the-fact checks on that year's production. The juvenile per adult ratio in the harvest reflects the increase in the population as a result of the nesting season.

Brood surveys have been done in the past in the western regions in cooperation with BLM and USFS personnel, but these surveys were discontinued because of the small sample sizes of brood observations obtained. Managers decided the cost of doing a reliable survey such as recommended by Peterson and Frisina (1987)

was too costly in terms of the real value of the results to the management of upland birds.

Hunting Seasons: State law first provided for the establishment of hunting seasons for grouse in 1870. In 1895 the Board of Game Commissioners established the first bag limits for grouse at 100 grouse or prairie chickens. By the early 1900s, hunting seasons and bag limits for mountain grouse had become much more restrictive. By 1940, there was a one-day season. From 1960 to 1970, season lengths ranged from 57 to 78 days in length. By 1990, mountain grouse seasons had increased to 93 days.

Season length was originally imposed to attempt to control the season harvest. However researchers have demonstrated that the majority of harvest occurs during the first few days of the season. In Colorado for example, it was found that an average of 85 percent of the grouse checked at game checking stations operated throughout the season were taken during the first 9 days of the season from 1977 through 1982 (Braun and Beck 1983). With blue grouse, early harvest is related to the altitudinal migration of the birds. Weigand (1978) stated that blue grouse normally begin leaving lower brood areas by mid-August. Dispersal may be hastened somewhat in dry years or delayed in wet years. An early September opening is desirable before blue grouse gain the relative sanctuary of high, roadless, mountain elevations.

Chrest (1968) reported that over 75% of the blue grouse harvest in Region 3 had occurred two weeks before the opening of the big game season. John Firebaugh (Pers. comm.) reported that the longer season provides additional hunting opportunity to a small number of dedicated mountain grouse hunters. This was born out by Hoffman (1983) who stated that season length had no influence on the distribution of the harvest. Hunters exhibited the "opening weekend syndrome", hunting primarily right after the season opened.

Weigand (1978) reported that grouse seasons opened the first Saturday after Labor Day during most years beginning in 1970. Opening the season at this time allows hunters to take birds which are about three-quarters grown, replaces some natural mortality with hunter harvest, and takes advantage of a normal period of higher probability of precipitation in late summer.

Mountain grouse seasons have traditionally opened on Saturday, a reflection of the resident hunter's ability to recreate on weekends. This results in an annually varying opening and closing date. Typically the season has closed on a Sunday, taking advantage of the weekend period.

Adopting a standard opening and closing date for mountain grouse seasons would eliminate annual or semi-annual season setting, a time-consuming, costly process. It would in most years mean that the season would open and close during the week.

Closing during the week does not appear to be a serious concern to Montana hunters as duck seasons have closed mid-week during "split seasons" for most of the past twenty years. Hunters and some landowners have expressed the concern that opening during the week benefits the nonresident hunter who is travelling to Montana on vacation. To these hunters, it makes little difference if the season opens on a weekend. This situation enables the nonresident to get "first crack" at the birds before the resident. However, check station and harvest survey data gathered in recent years suggest that hunter activity even on opening weekend, at least for partridge and grouse, is much reduced from what it was 20-30 years ago (Lonner et al. 1990). The actual loss to resident hunters from a mid-week opening is probably perceived as greater than can be substantiated.

The benefits of setting a long term opening and closing date would be: 1.) reducing the costs of current season setting processes; and 2.) reducing hunter confusion about what the season opening dates are each year.

Daily Bag and Possession Limits: As mentioned above, the bag limit for grouse was originally an aggregate bag of 100 birds. An aggregate bag for mountain grouse has been the rule during the entire history of mountain grouse bag limits in Montana. The reasons for this are: 1.) in many areas, a hunter may encounter two or three species of these grouse in a single outing; 2.) grouse flushing in heavily forested areas are difficult to see clearly in some cases, making it difficult for the hunter to readily identify them 3.) an aggregate bag for mountain grouse is accepted by hunters as traditional; and 4.) it does not limit or benefit the hunter.

The possession limit for mountain grouse is currently four times the daily bag limit. This quadruple possession limit was instituted in part of the state in 1983. Hunters have generally supported this possession limit because it enables hunters to legally possess a larger supply of birds in their freezers once seasons close. Nonresident hunters benefit by being able to take a larger number of birds home with them after a long hunting trip to Montana.

Means of Taking: Some individuals or groups believe that the means of taking mountain grouse should be changed to disallow the use of rifles or pistols. In contrast to other upland game bird species, mountain grouse in Montana can be legally taken with a rifle or pistol. A good measure of the general acceptability of that statute is to look to neighboring states for their statutes or regulations regarding the issue.

New Mexico permits grouse to be taken with any firearm except fully automatic firearms. Alaska permits small game to be taken by any method except a machine gun, set gun, or shotgun larger than ten

gauge. Idaho permits mountain grouse to be taken with shotgun, longbow, recurve bow, compound bow, falconry, rifle, pistol, slingshot, or hand-held or thrown missiles. Wyoming regulations require a shotgun not larger than a ten gauge to be used in taking game birds but exempts blue and ruffed grouse from that requirement.

The general acceptance of taking mountain grouse with rifles and pistols in so many western states suggests that hunters accept the notion that if they wish they should be able to take them with a firearm other than a shotgun. This probably reflects the idea that big game hunters want to be able to take mountain grouse with their rifles or pistols without having to pack a shotgun. Another consideration is that mountain grouse are often reluctant to fly and once on the wing, may not provide a clear wingshot due to the forested or rugged aspect of their habitat. However, dedicated mountain grouse hunters using shotguns prefer to pursue the grouse deep into the back country hoping for wing shooting opportunities. Both types of hunters are accommodated by current regulations. Because of the low harvest rate of these species (Mussehl 1960), the issue of equitable distribution of harvest between the different types of hunters is not a concern.

Trends in Harvest and Hunter Activity: Lonner et al. (1990) showed that hunter harvest for blue grouse, ruffed grouse, and Franklin's grouse has declined significantly since 1980 (Appendix, Table 1 Figures 1,2, and 3, respectively). The reasons for this decline are complex and probably relate to a number of factors including:

1) a decline in habitats and numbers of birds in some areas;

2) an overall decline in hunter numbers;

3) the pesticide controversy of 1981-82;

4) economic factors affecting costs associated with hunting and travel, and

5) social factors, such as numbers of children living in single parent families.

Harvest survey techniques, which changed in 1981, have also probably resulted in lower harvest estimates since 1981. Mussehl (1960) reported that blue grouse hunters in the Bridger Mountains took only about 10 percent of the banded grouse in his study area during 1957 and 1958. The decline in the number of bird hunters in Montana (Appendix, Table 2, Figure 4) suggests that if mountain grouse habitats across the state have not similarly declined during the same period, the harvest rate of these species is probably even less than during the higher harvest years, 1960-1980.

PRAIRIE GROUSE

Population Estimation: Sage grouse and sharptail populations are monitored in the spring by censusing displaying males on trend areas in Regions 3,4,5,6, and 7. Charlie Eustace (Pers.comm.) correlates annual sage grouse production with numbers of males censused on leks, July temperatures, and other factors. He has found that 62% of the variation is accounted for by the numbers of males and the average July temperature. Eustace's correlation shows that counting the number of male sage grouse is a fairly reliable index to what the late summer/early fall population will be. It is this relationship that motivates biologists and managers around the state to count sage grouse as well as sharptails on known leks. Such counts have been conducted on some areas since the 1950s. These figures are not used as a basis for setting seasons for prairie grouse however as seasons are now set in advance of these surveys.

Hunting Seasons: Prior to 1870 there were no regulations relative to hunting sage grouse or sharptails in Montana. In that year the season on these species was closed from March 1 to August 15. In the early 1900s regulations became more restrictive until in 1927 the season was closed completely. For the next ten years, seasons for sage grouse were short, usually only three days in length. During 1936 and 1937, the sage grouse season was again closed. Seasons for sage grouse were closed from 1945 to 1951. Sharptail seasons in those years ran for two to seven days. From the early 1950s into the 1960s, biologists gathered information on Montana's grouse populations which served as a basis for more liberal seasons and bag limits. Seasons for sage grouse for example were extended to 15 days and covered a larger portion of the state (30-35 counties).

In the last thirty years, the area open to prairie grouse hunting has been maximized and seasons liberalized. In 1990 for example, only nine counties, mainly west of the Continental Divide, were not opened at least in part to the hunting of prairie grouse. Seasons in most of the state ran from early September to mid-December, 1990; 107 days in length.

The gradual increase in season length since 1958 in Region 5 has seen an apparent decline in opening weekend effort (Eustace, pers.comm.). Check station records in the Billings area indicate that during the period spanning 1958-68, the number of opening weekend hunters was much greater than since 1969. In the early period, the bird season averaged 19 days. Since 1969 seasons have averaged 72 days. The implication is that since hunters know that they have a much longer season to hunt upland birds, there is less incentive for them to go afield on opening weekend.

The change in the season length for prairie grouse over the last forty years from 3 days to 107 represents a realization that season

length has little effect on harvest. A review of literature on western grouse populations shows that there has not been a documented instance where harvest has had an effect on the subsequent year's breeding population of prairie grouse.

Wallestad (1975) reported that from 1962-67, 35-55 percent of the sage grouse harvest in the Yellow Water Triangle area of Montana occurred on opening day and 70-80 percent during the first week. This agrees with Braun and Beck's (1983) reported 85% harvest in the first nine days. This realization led Wallestad to conclude that the length of the season doesn't have much effect on total bird harvest. Other research studies have shown that season harvest varies with harvest on opening day and not with season length. Opening day harvest according to Hillman and Jackson (1979) and others relates to weather, whether there are any other seasons opening on the same weekend, condition of back country roads, distribution of the birds relative to prime feeding areas, and other factors.

In most recent years, the prairie grouse season in southwestern Montana (Region 3) has been shorter than in most of eastern Montana. Prairie grouse populations in this area are smaller than in the major prairie areas of the eastern part of the state. Peterson (Pers. comm) stated that the shorter seasons in this area have been recommended because the sportsmen want it that way. Because of the smaller number of birds, the shorter season and smaller bag limits are perceived to distribute the harvest better.

This represents another instance where hunter perceptions and results of research and surveys disagree. It has not been demonstrated in Montana that the surplus of upland birds available to hunters in the fall is so limited that it is necessary to set a shorter season or a restrictive bag limit to distribute the harvest between hunters. It has not been demonstrated that if one hunter stopped short of taking a full limit of birds or of taking the maximum number of trips afield that he would normally take, it made more birds available to another hunter to shoot.

The first established prairie grouse season in Montana opened on August 15. During the ensuing 70 years, seasons for prairie grouse opened as early as July 15 and as late as October 1. In the past 40 years, most prairie grouse seasons have opened in September.

Opening dates for prairie grouse are a function of a variety of factors as for mountain grouse. The early opening date for sage grouse was originally a concession to the old-time "sagehen" hunters who found the flesh distasteful from any but the very young juveniles taken in the summer (Eng, pers. comm.). At one time, this was an important consideration as the sage grouse was the leading upland game bird in nine western states during settlement times (Rasmussen and Griner 1938). Watts and Feist (1985) reported that the grouse season, almost without exception, opened on the first

Saturday after Labor Day every year from 1968 through 1985. This represents a balance among rapidly changing weather conditions, age of juveniles, grouse behavior and landowner considerations.

In the past opening dates for prairie grouse have been set in consideration of the age and size of juvenile birds as the majority of the harvest is young birds. Watts and Feist (1985) reported that most juvenile grouse have achieved approximately 75% of their growth by early September.

Delaying the opening of the prairie grouse season until September is in part based on attempting to take advantage of a higher precipitation period that occurs in much of Montana during the last part of August and early September (Weigand 1978). Opening the season in August could present a greater threat from hunter-caused fires.

Watts and Feist (1985) reported that because prairie grouse experience high rates of mortality, it is prudent to open upland bird seasons as early as possible while numbers of birds are relatively high. They, like Weigand (1978), cited brood combining as an important factor in opening seasons early. Weigand reported that sage grouse broods begin combining in August and sharptails in September. These larger groups of birds have been found to be more difficult for hunters to approach. Delaying the season until late September or even October would greatly reduce the hunters' ability to find birds which were readily approachable.

Another consideration in opening the prairie grouse season in September is the fact that it precedes other seasons. Hillman and Jackson (1979) pointed out that opening the sharptail season at the same time as other game seasons reduces the harvest of sharptails as hunters must choose between different types of hunting. In Montana, waterfowl seasons typically open the first two weekends around the first of October, and antelope and pheasant seasons typically open the next two weekends.

The impact of a long upland bird season on private landowners has been a point of contention for many years, as cited by Watts and Feist (1985). In 1985, landowner sentiment dictated that the upland bird season close one week after the big game season which was December 8. By 1990, the grouse season had been lengthened, and closed three weeks after the close of the general big game season. This longer season may be more tolerable now because landowners have come to realize that although the season may be open longer, few hunters participate.

Closing date for the prairie grouse season as for mountain grouse is strictly a function of the desired season length counting forward from the opening date. As with mountain grouse, the prairie grouse season has typically closed on a Sunday to benefit those hunters unable to hunt during the week. With current liberal

seasons, if the season were to close during the week it is expected that hunters would probably express little dissatisfaction. Set dates for opening and closing prairie grouse seasons would minimize the costs of setting these regulations annually and would also reduce hunter confusion with annually closing season dates. This could be further enhanced with a statewide set opening and closing date for all grouse, bracketing all currently existing seasons. As cited by Braun and Beck (1983), "...grouse hunting regulations should be standardized for a period of years since there is no need to indicate a precision of knowledge that most wildlife agencies cannot achieve."

Daily Bag and Possession Limits: Daily bag limits for sage grouse and sharptails have followed the same history as those for mountain grouse. Initially, limits were very liberal, such as the 100-bird bag in 1870 and the 20-bird bag in 1901. However, as numbers of birds declined and numbers of hunters increased, limits were imposed. Martin and Pyrah (1971) reported that sage grouse populations in the state began to plummet during the early 1940s in response to major habitat impacts as a result of settlement and agricultural development on the prairies.

Prior to 1959 possession limits were either three birds per day or 3 birds in the aggregate which included all native grouse. However, in most recent years possession limits on sage grouse and sharptails have been separate and have been 2 times the daily bag. For sage grouse and sharptails, the daily bag and possession limits have been either 3 and 6 or 4 and 8 birds of each species for most years since 1959. In 1983, possession limits on prairie grouse as for mountain grouse were increased to 4 times the daily bag.

Watts and Feist (1985) believed that bag limits were the primary tool for distributing the harvest among hunters but had not been shown to impact populations. They believed that a daily bag limit of 3 is a point below which there would be little incentive to go hunting and that a daily bag of 6 would be a maximum in terms of providing additional opportunity. Individual daily harvests of upland birds tend to run between 1 and 2 birds based on check station data from around the state. The percentage of hunters able to achieve a daily bag of 3, 4, or up to 8 birds of a species in a day decreases as that bag limit increases.

At some point the limited additional harvest opportunity experienced by a few hunters afforded by a liberal daily bag is offset by the dissatisfaction of a larger number of hunters who lose the opportunity of having "met the standard" which to them their daily bag limit represents.

Trends in Harvest and Hunter Activity: Appendix Table 1 and Figures 5 and 6 show trends in hunter harvest of prairie grouse since 1958. Appendix Table 2 and Figure 4 show changes in hunter numbers and activity during that period. Sharptail harvest has been on a long

term declining trend since about 1975. Hunter numbers have also declined during this period. Sharptail populations have suffered during this period due to accelerated sodbusting, drought conditions, and including the related impacts of grazing pressure that have prevailed in eastern Montana during the 1980s.

Sage grouse hunter activity and harvest has declined even more dramatically than those for sharptails. Appendix Figure 5 shows that sage grouse harvests have been declining since 1960 despite liberal seasons and bag limits. This is believed to be a function of habitat change including loss of the big sagebrush/grassland type to sodbusting and degradation of remaining areas through overgrazing.

RING-NECKED PHEASANTS

Population Estimation: Pheasant breeding populations are surveyed in every region in the state. Pheasant crow counts enable biologists to track the change in pheasant populations over time. Some of these same crowing count routes have been run since 1949 such as those in the Bitterroot Valley (Firebaugh, pers. comm.). Biologists and managers use this information to answer questions about the prospects for that year's production as well for the upcoming hunting season. Eustace (Pers. comm.) has run multiple regression analyses which show a strong correlation among the fall harvest, the number of cocks censused that spring, and the precipitation received during May and June. The crowing count figure alone accounts for almost 80% of the variability in the harvest.

Weigand and Janson (1976) reported that the pheasant population in Montana crashed during the mid-1940s. It has fluctuated around a much lower level since that time. Annual crow count surveys measure changes in this reduced population in response to short term changes in weather, habitat conditions, livestock numbers, agricultural practices, and other factors. The long term impact of major changes in Montana's pheasant habitat was never measured as it preceded systematic population surveys.

Hunting Seasons: The first pheasant season in Montana was initiated in 1928, about thirty years after the birds were introduced into the northwestern U.S. This first season was for a limited area and ran for only two days in late November. In 1932 the season was five days in length and included most of the better pheasant areas. In 1941, prior to the population crash, the season was 22 days in length, opening in late October. In 1942, a 10-bird either sex season was opened in parts of Region 5 from late September to early October. A 3 to 4-week season was later opened in most of the remainder of the state.

In 1946 in response to the population decline, the season was closed. The next year the season again opened in late October and

ran for 8 days. By 1959, pheasant seasons were typically running for 29 days beginning in late October. Beginning in the early 1970s seasons were increased to 36 days, then to 43 days. In 1983, the season length was increased to 51 days. In 1977, pheasant hunting extended into December for the first time since seasons were initiated. In 1990, the season was 51 days west of the Continental Divide and 65 days east of the Divide.

Weigand and Janson (1976) reported that check station information from Regions 1, 2, and 4 collected from 1948 to 1950, showed that over 60-70% of the total season's pheasant harvest was taken opening day. This "opening day syndrome" is in part the basis for recommending a long pheasant season. Despite adding additional days, a longer season adds little additional harvest. Instead what results is some late season hunting opportunity for a small number of avid pheasant hunters.

Pheasant seasons have opened earlier and closed later in recent years. While providing more opportunity for avid hunters, they run the risk of wearing out the hunters' welcome with landowners. This is a greater risk with pheasant seasons than those for grouse because: 1.) pheasants occur almost exclusively on agricultural lands most of which are privately owned; and 2.)there are more pheasant hunters than there are grouse hunters, or for other upland game species. Upland bird species harvest statistics for Montana for 1989 (Appendix, Table 3) show that pheasant hunters statewide outnumbered sharptail hunters almost 2:1; sage grouse hunters almost 4:1; and blue and ruffed grouse hunters by nearly 3:1.

Trautman (1982) reported that since 1958, the pheasant season in South Dakota has opened on the third Saturday of October. This date is based on good hunting weather, most young birds being identifiable as to sex, and crop harvesting having progressed favorably.

Janson et al. (1971) reported that liberal pheasant seasons are based on research studies which have shown that it is virtually impossible to overshoot cock pheasants. Trautman (1982) also reported that hunting season length has not influenced pheasant density in South Dakota. The lower density regions remain lower despite their shorter hunting seasons and smaller cock harvests.

The first Montana pheasant season in 1928 opened on November 24. Most years since then the season has opened sometime between October 24 and October 30. From 1983 to the present, pheasant seasons have opened approximately two weeks earlier. The reason for the late opening on pheasants is a function of several factors, including an extended hatching period, need to identify sex, and conflicts with agricultural practices.

Pheasant young hatch over a long period of the summer. Young chicks can be seen as late as early September, even though most

will typically be hatched in mid-June. Although many other species of upland game birds will renest, pheasants are especially noted for renesting 2 or 3 times (Eng, pers.comm.). This explains the tremendous variation in ages of young pheasants harvested in the fall. Renesting is the result of pheasants losing their nests to predation, destruction by farming operations, and other factors. The more severe the losses to these factors, the more renesting and the more "late broods" will probably result.

By requiring that hunters shoot only cock pheasants, it is necessary to allow the later hatched birds to reach approximately 14 weeks of age when the white neck ring and other plumage characters become visible on male birds (Weigand, pers. comm.). In so doing, the earlier hatched birds are left unharvested until they are much older. Delaying the opening date to accommodate plumage development has its disadvantages. A constant loss of birds from the population is ongoing as predator-caused and other losses accumulate. Weigand and Janson (1976) reported that fifty percent of the pheasants are lost between hatching and nine weeks of age. Although the rate of loss of young pheasants between nine weeks of age and the time the season opens is less, daily losses do reduce the number of birds which hunters will have opportunities to bag.

Opening dates for pheasants traditionally were late to correspond with the corn harvest in some parts of the state (Weigand, pers. comm.). In recent years, few such conflicts have been reported.

Shooting Hours: Montana traditionally opened its pheasant season on a Sunday to accommodate hunters working a 6-day week. Noon openings became traditional so that pheasant hunters weren't bothering landowners for permission at dawn.

In Montana, the Sunday and noon opening traditions were both ended in 1983 when the season was opened on Saturday at one-half hour before sunrise, similar to the traditional opening for grouse. Hunters have appreciated having two full days of hunting on opening weekend as opposed to one-half day. Landowners apparently are not any more inconvenienced by these opening dates and times than by the overall season and hunters in general. Trautman (1982) reported that in South Dakota the noon opening was extended to the entire season. This practice is popular with farmers and generally agreeable to sportsmen.

Shooting hours in South Dakota close at sunset. In the earlier years of pheasant hunting in Montana, shooting hours were from 8:00 AM to 5:00 PM. Eventually shooting hours were moved to sunset. This was changed in 1979 to one-half hour after sunset to make shooting hours for pheasants the same as those for other upland game birds.

Closing dates for pheasant hunting in neighboring states generally run later than in Montana. The state of North Dakota this year

lengthened its pheasant season to January 6, 1991. Nebraska, traditionally one of the better pheasant hunting states in the western U.S., closes its pheasant season on January 31. Montana's pheasant population could also provide hunting into January if the public were willing to accept a season of this length. Hunters would need to support this long season and landowners would probably need to be provided with incentives to continue to host pheasant hunters into the winter.

Daily Bag and Possession Limits: The daily bag and possession limit for pheasants has been 3 cocks daily and 6 in possession during the majority of Montana's pheasant seasons (Weigand and Janson 1976). During some years of restrictive seasons, the daily bag and possession limits were 2 cocks daily and 2 in possession. In more liberal years, 5 cocks daily and 10 in possession were allowed. During the peak pheasant years, 1942-43, bags of up to 7 pheasants daily were allowed which could include 2 hens. From 1959 to 1973, one hen was permitted in the daily bag in at least a portion of the state.

Since the mid-1970s, the daily bag has varied between 3 and 4 cock pheasants. In 1983, the possession limit for pheasants as for other upland game birds was increased to four times the daily bag.

Other states also have had liberal possession limits for pheasants. In Nebraska and South Dakota possession limits of four or five times the daily bag have been permitted. Permitting these liberal possession limits to resident hunters was motivated in part because many of the better bird hunting areas are in the western parts of these states while the major population centers lie in the east. Permitting hunters to have a large possession limit allows these hunters to travel to the western part of the state and hunt for several days and bring home a large number of birds. Attracting nonresident hunters with larger possession limits was motivated in part by a desire to increase revenues generated by the sale of nonresident licenses.

Trends in Harvest and Hunter Activity: The harvest of pheasants in Montana since the mid-1960s has fluctuated around a low level in comparison to earlier years (Appendix, Table 1, Figure 7). In a 12-day period in 1948, Montana hunters shot an estimated 198,000 birds. Weigand and Janson (1976) reported that the average harvest from 1958-73, a 16-year period, was 161,000 pheasants annually. During the most recent 16-year period, 1974-1989, the average pheasant harvest was only 88,000, nearly 50% less than what it was during the previous period. Weigand and Janson (1976) pointed out that although the kinds and abundance of predators have fluctuated and hunting regulations have varied, they have had short term effects on pheasant populations. The factors which have had the most noticeable effect on pheasants during this century have been land use changes and land management practices.

Also contributing to the declining harvest of pheasants has been a decline in hunter activity as indicated in Appendix, Table 2 and Figure 4. Reasons for this decline are discussed above relative to declining numbers of grouse hunters. Access to private lands, an ever-increasing concern to wildlife managers in the predominantly privately owned eastern 2/3 of this state, has probably also contributed to declining pheasant hunting activity.

Hen Pheasant Hunting: The question of hunting hen pheasants has probably arisen in every major pheasant hunting area in the country at one time or the other. Biologists have studied the question for the past forty years, trying to determine whether such a regulation is biologically justifiable. Game department administrators, Fish and Game commissioners, and other decision-makers have in the meantime wrestled with the sociological and political aspects of allowing the hunting of hen pheasants.

Pheasants are the only upland game birds in Montana which can be readily identified as to their sex by hunters. All species of grouse, doves, snipe, partridge, and turkeys exhibit external characteristics which allow birds to be identified as to sex but only with more careful observation than is usually afforded to a hunter flushing birds at his feet. An exception to this rule is with turkeys. In the spring season hunters are required to identify the birds as to sex. However, the birds are often not flushed, but rather are observed at close range by the hunter using either a telescopic sight on a rifle or binoculars or a spotting scope, or while approaching the hunter who is calling the bird into shotgun range.

The fact that pheasants can be readily identified as to sex has inevitably lead to cocks-only hunting. Eustace (1970) stated that the only justification for a cocks-only season is that hunters can tell a cock from a hen, a weak justification at best. He pointed out that pheasants face no basic problem not faced by other upland game birds. The fact that cocks-only hunting continues to the present day is because of the common belief that hunting hen pheasants may somehow harm the population. Some hunters also probably do not consider the hen pheasant as sporting as the cock pheasant. These same hunters are stalking and shooting female grouse, partridge, and other upland game bird species.

Weigand and Janson (1976), Weigand (1973), Harper (1960), Galbreath (1971), Bailey et al. (1964) and others have researched the question of shooting hen pheasants. Weigand (1973) outlined the results of either sex or 1-hen bag experiments and operational seasons in Montana. From 1959 through 1973, either sex hunting of pheasants was allowed in parts of Montana. However, since 1973 hen pheasant hunting has not enjoyed widespread support in the state. This probably relates to declining pheasant habitats and populations since the early 1970s. Hunters, landowners, commissioners and others have understandably opted for a

conservative approach to hunting realizing that pheasant numbers are comparatively low in the state.

All of the above studies indicate that hen pheasant hunting is an appropriate approach to harvesting pheasants. Weigand (1973) reported that annual mortality of pheasants, hens or cocks, is between 60 and 70 percent. In a study on a Wisconsin refuge where pheasant hunting was not permitted, annual mortality of pheasants was 81% (Buss, 1946). Harper's (1960) study showed that annual mortality of hen pheasants was 65% before and during institution of hen pheasant hunting regulations.

The benefits of hen pheasant hunting were well documented by Weigand and Janson (1976) from Montana studies. These studies indicated that: 1) hen pheasants could be taken by hunters with no adverse effect on subsequent breeding populations; 2) permitting hen shooting resulted in hens averaging 60% of the bag during the last eight days of an experimental season; 3) average seasonal bag of successful hunters was increased, up to 3.6 birds; 4) hen pheasant hunting reduced the amount of time hunters needed to reach their limit; and 5) hen pheasant hunting would permit hunters to utilize some portion of that mortality which is now being lost to predators, weather, and other causes of death.

The study in California by Harper (1960) indicated that at least 45 percent of the fall hen population could be harvested without affecting the spring breeding population. During an experimental pheasant season in Region 5 in 1942 where a 10-bird either sex limit was allowed for two weeks beginning in late September followed by a regular 4-week season with a 3 cock and 1 hen bag per day, only an estimated 24% of the population was taken from the study area. This represents only one-half to one-third of the number of birds that would have been lost from that population as a result of natural mortality in that year.

Janson et al. (1971) indicated that liberal seasons are based on research results which have shown that it is virtually impossible to overshoot cock pheasants. Shooting cocks has no effect on populations of following years. Hunting only cocks does not ensure that all hens will survive to raise broods.

Pheasant Stocking/Trapping/Transplanting: Because of the pheasant's popularity with hunters, much effort has gone into creative ways to build their populations to improve hunting opportunities. Pheasant stocking, as a follow-up to the original releases which introduced the bird into this country, has been very popular with sportsmen over time. Interest in supplemental stocking in Montana led the Department to operate three pheasant rearing facilities during the period 1929-1942. The last of these three "pheasant farms" was phased out in 1982.

Studies by biologists in this and other states indicated that once pheasants naturally inhabited suitable habitats, releasing additional birds did little to supplement populations. Weigand and Janson (1976) reported that an average of 13 percent of the banded game farm pheasants released in Region 4 during an 18-year period were returned by hunters. The remaining 87 percent of these birds raised with hunter dollars served as food for predators and scavengers. The results of such investigations have prompted game departments throughout the country and national organizations such as Pheasants Forever, Inc. to get out of the stocking business. Instead, the funds previously channeled into raising and releasing pheasants are now going into habitat programs to raise more wild birds in natural habitats. Montana's Upland Game Bird Habitat Enhancement Program is such a program. Originally proposed in the legislature as a pheasant stocking program, the Habitat Enhancement Program quickly evolved with sportsmen and legislative support into an appropriate habitat enhancement initiative. Although pheasant stocking is still provided for by this program, it represents less than 1% of the funds expended to date.

HUNGARIAN AND CHUKAR PARTRIDGE

Population Estimation: There are currently no systematic surveys being conducted to determine the status of populations of Hungarian (huns) or chukar partridge. Population status is monitored indirectly through determining the harvest through the statewide harvest and wing collection surveys. As populations fluctuate, the harvest of huns and chukars generally track these changes.

1987 for example was found by most Montana bird hunters to be the "best hun year" in recent times. The Hungarian partridge harvest jumped to nearly 90,000 birds from just over 20,000 the previous year (Appendix, Table 1; Figure 8.) This nearly five-fold increase in harvest in one year is a strong indication of the reproductive potential of this species. Montana hunters were given the opportunity to take advantage of this harvest opportunity without the benefit of annual population surveys because of the current liberal regulations framework.

Because chukar habitat is very limited in Montana (Whitney 1971), population surveys are impractical. As with huns, collection of harvest data for chukars is the only means by which the department monitors population status. As shown in Appendix Table 1 and Figure 9, chukar harvests have been decreasing since the early 1960s. The causes of this decline are unknown. In the last ten years a contributing cause is declining hunter numbers and participation in upland game bird seasons (Appendix, Table 2).

Hunting Seasons: The first season for Hungarian partridge was opened in 1929 for four days. At that time they were taken under the pheasant limit as part of a 3-bird aggregate bag. According to Mussehl and Howell (1965), concurrent pheasant-partridge seasons

were held from 1929 until the late 1950s except for closures in 1937-39, 1946-48 and 1950. Beginning in 1958, partridge hunting was also allowed during the earlier prairie grouse season.

Chukars, first released in 1933, were opened to hunting in 1959. Because of such restricted population distribution, the total prime hunting area is limited. Bag limits have been in aggregate with huns and season lengths have coincided with those for huns. With a few exceptions, chukars in Montana have established only marginal or localized populations. Evidence indicates that the primary limiting factors are insufficient habitat and sensitivity to Montana winters.

Beginning in 1982, partridge seasons in a portion of Carbon County were set to run into early January to permit hunters an opportunity to hunt partridge, particularly chukars, at a time when they are more huntable due to snow and colder weather. In the majority of the state, partridge seasons close in early December. In 1990, partridge hunting closed in western Montana on December 2 with the mountain grouse season. Partridge hunting closed in eastern Montana on December 16 as did seasons for prairie grouse and pheasants. The evolution of similar hunting seasons for these different species is based on the realization by managers that upland bird hunters are hunting and encountering these species in many of the same locations simultaneously. No special biological considerations require that seasons for any one species be drastically different than for the group.

Daily Bag and Possession Limits: Bag and possession limits for partridge have traditionally been large. According to Trueblood and Weigand (1971), Hungarian partridge have the highest annual mortality rate and highest productivity rate of any Montana upland game bird. These factors enter into the liberal limits for partridge.

Hungarian partridge bag limits have evolved from a 3-bird aggregate bag with pheasants to as many as 8 partridge allowed per day. Bag limits for chukars since 1960 have been in aggregate with Hungarian partridge. During most years, the daily bag limit for partridge has been six in aggregate with 12 in aggregate allowed in possession.

As with grouse and pheasants, the possession limit for partridge was increased to four times the daily bag in portions of the state beginning in 1983. In 1988, the daily bag limit was increased to eight birds with 32 in possession. This constituted the highest daily bag and possession limit allowed on any upland game bird in Montana in recent times.

Trends in Harvest and Hunter Activity: The chukar harvest has declined in recent years (Appendix, Table 1 and Figure 9). The harvest of huns has fluctuated over the last thirty years

(Appendix, Figure 8), as weather and habitat conditions varied. Despite the periodic peaks in the hun harvest, these peaks have declined in recent years, possibly in part due to lower hunter participation in the 1970s and 1980s as compared to the 1950s and 1960s (Appendix, Table 2).

It is interesting to note that for a 5-year period beginning in 1958, the average harvest of Hungarian partridge was 50,000 birds (Appendix, Table 1) while in the most recent 5-year period ending in 1989, the average harvest also was about 50,000 birds. Twenty years of habitat change in Montana, has obviously had little effect on the hun's ability to respond to conditions favorable to their increase. This is probably related to their limited habitat needs. Weigand (1982) reported that his study in Teton County showed that the majority of marked huns on his study area lived and died in an area about 240 acres in size. According to Weigand, huns are unique among Montana's upland birds in their ability to survive in a tiny piece of habitat. They can subsist in remnants of bird habitat too small to meet the needs of any other species.

Weigand (1982) stated that partridge populations in Montana are grossly underutilized. Only 3% of huns banded in Teton County from 1969-1973 were taken by hunters. They could endure annual harvests ten times the level they currently do. This relates in part to their 75% annual turnover rate and ability to hatch a brood of up to 26 young (Weigand pers. comm.). Weigand (1982) recommended that the Commission increase the daily bag to eight to ten birds, increase possession limits to four to five times the daily bag, and lengthen the season. Since that recommendation was made, the Commission has done just that.

MERRIAM'S TURKEY

Population Estimation: No systematic surveys are conducted in the state to determine the status of wild turkey populations. Random winter and spring surveys are conducted in some areas where turkeys can be readily censused. Knapp (pers. comm.) and Risdahl (pers. comm.) have intermittently conducted pre-season population surveys for turkeys along the Powder River in the Broadus/Powderville area intermittently during the past ten years.

Biologists and managers monitor turkey populations by cursory observations, interviews with landowners, and by monitoring harvest levels. Turkey harvest in Montana has steadily increased since their introduction in the mid-1950s (Appendix, Table 1 and Figure 10). As turkeys have been introduced into more areas and have naturally pioneered into others, not only their distribution but their total numbers have increased, producing an increasingly greater harvest.

Hunting Seasons: Hunting seasons for turkeys in Montana began with the first fall season in 1958 when 89 turkeys were taken (Jonas

1966). The first spring gobbler season in Montana was in the Long Pines of southeastern Montana, April 7-21, 1963. During that season, 58 hunters took 7 gobblers.

Comparisons of turkey hunting seasons at ten-year intervals nicely demonstrate the increasingly more generous seasons and hunting opportunities which have resulted from turkey management in the state since the late 1950s. The spring season in 1970 included Fergus County, part of Phillips County and portions of the Custer National Forest in southeastern Montana. The season was 16 days in late April. The fall season that year was limited to the Bull Mountains area and most of Region 7 and ran from September 25 through November 28 in portions of that area. The season in any one part of that area ran a maximum of 43 days.

In comparison, the 1981 fall turkey season opened on September 19 and ran as late as December 6 in some portions of the hunt area. Only two hunting areas were open to fall hunting in that year: the Bull Mountains and southeastern Montana. The spring season that year included all or part of seven counties and ran from April 11 to April 30.

By 1990, the fall season was opened in 7 different areas around the state with seasons in some areas beginning on September 1 and closing in all on November 25 (an 86-day season). The spring season in 1990 was held in 10 hunt units and ran from April 14 through May 6 (a 23-day period).

Timing of the fall season has evolved over the 35-year period of turkey hunting from a late opener to an early one, similar to season openers for grouse, pheasants, and partridge. Part of this evolution is related to the fact that during the early years, much of the turkey hunting was done by deer hunters who took turkeys incidental to their deer hunting. As turkey numbers increased and hunting just turkeys became more productive, turkey hunting began to attract a greater number of hunters hunting specifically for turkeys. The inevitable result was longer seasons, opening early in September and running through early December. Because turkeys occur in large part on privately owned land, long hunting seasons run the risk of constituting a nuisance for the private landowner.

The biology of turkeys does not preclude hunting them in September. Juvenile birds, in years of extensive renesting will be small in early September. However, hunters do have the opportunity to shoot adult birds or wait until later in the season to shoot their turkeys.

One advantage of running the fall turkey season into December is that in parts of the state, notably southeastern Montana, large aggregations of birds occur in late fall and winter. Crop depredation on harvested grain, grain hay, and livestock feeds occurs in some areas when as many as several hundred turkeys move

into farm and ranch yards in search of food. Allowing hunters to hunt during the period that these aggregations are occurring presents good harvest opportunities and may give the farmer/rancher the feeling that hunters are scattering or reducing these depredating flocks.

Cold, wet weather can impact the success of the spring hunting season, both in terms of bird activity and in terms of hunters mobility. Because of the unpredictability of spring weather and the wide variety of areas open to spring hunting in Montana, setting a season that would bracket the peak gobbling activity in an average year should be the main goal of setting spring turkey opening and closing dates. In 1988, the Commission voted to open the spring season on the third Saturday of April. Since that time, the calendar change has made this standard opening impractical.

Timing of the spring season relates primarily to the period of peak gobbling activity by the males. Donohoe (1990) reported that peak gobbling activity in Ohio occurs around the third week in April and continues into May. In that state, season dates are set to correspond with the period when most hens are incubating so that hens are unlikely to be encountered by hunters and mistakenly shot as gobblers. Incubation in Ohio has been found to begin the last half of April and run through mid-May. Similar timing of turkey breeding was reported by Donohoe to have been observed in Pennsylvania and the Virginias. The 23-day season offered in Montana in 1990 may have bracketed the majority of the period of peak gobbling and the onset of incubation. Running the season an additional 7 days may provide more harvest opportunity in years when male activity continues past the first week in May..

Daily Bag and Possession Limits: Turkey bag and possession limits in Montana are one bird, for which the hunter purchases a tag affixed to the carcass upon kill. It is currently possible for a hunter to buy a tag valid for the spring season and a second one valid for the fall season. Hunters are eligible through drawings to obtain special permits to hunt in limited hunt areas, typically in the western portion of the state. Previous to issuing separate fall and spring turkey licenses, the Department issued turkey tags which could potentially be used for two seasons. In those years, if a hunter purchased a turkey tag in the fall and was unsuccessful in bagging a turkey, the tag was still valid until the end of the license year which extended through the spring turkey season the next calendar year.

Some hunters have suggested that because of the large numbers of turkeys in some areas, the season limit for a hunter should be raised to two. Evidence suggests that in portions of eastern Montana where turkey numbers have greatly increased during the past decade allowing a hunter to take two turkeys during the fall season would not produce an excessive level of harvest. As a result, Region 7 at the present time is recommending two turkeys per hunter

per season in response to sportsman demand for that opportunity. Turkeys often spend winter in private landowners yards which leads landowners to view the birds as pets rather than as hunting opportunities. To allow hunters to double their kill from a flock would be difficult for some landowners to accept. Some landowners who have experienced depredations due to too many turkeys may support a greater kill.

Trends in Harvest and Hunter Activity: Turkey harvest and hunter activity is the only type of upland game bird hunting for which the Department has exceeded its long term goals as outlined in the strategic plan (Mussehl et al. 1986). There has been a steady increase in turkey harvest especially in recent years (Appendix, Table 1 and Figure 10).

Based on the volume of correspondence the Department is currently receiving from resident and nonresident hunters, outdoor writers, and others, the demand for turkey hunting recreation is obviously growing. As long as populations continue to expand, harvest and hunter activity will probably continue to grow. Turkeys represent a bright spot in the upland game bird picture in Montana in 1990.

COMMON SNIPE

Population Estimation: No population surveys for snipe are currently being conducted by the Department. Taylor (1978) censused snipe in seven areas around the state from 1976 and 1977 and found breeding densities ranging from 20 to 130 pairs per square mile.

Hunting Seasons: Hunting seasons for snipe are set by the U. S. Fish and Wildlife Service as part of their Early Seasons regulations process. The Commission then has the option to select what the Service allows or to adopt seasons and limits which are more restrictive.

The U.S. Fish and Wildlife Service sets seasons for snipe in Montana separately in the Pacific and Central Flyway portions of the state. As a result, snipe season dates are different in western and eastern Montana. In 1990, the snipe season in the Pacific Flyway portion of the state opened September 1 and closed December 2. In the Central Flyway portion of the state, the season opened September 29 and closed December 30.

Seasons for snipe open early because most typically migrate early. Montana does winter a small number of snipe in protected sloughs, spring creeks and drain ditches. Taylor (1978) found in the Belgrade area that the peak of migration occurred in October. Permitting hunting into December is to provide hunting opportunity in those areas where birds are wintering around open water.

Because the snipe season overlaps with upland bird and waterfowl seasons in the state, no additional impacts on landowners result from a liberal season.

Daily Bag and Possession Limit: Bag and possession limits for snipe are set by the U.S. Fish and Wildlife Service. These limits have traditionally been generous. In 1990, daily bag and possession limits were 8 and 16, respectively.

Shorebird hunting was very popular during the 1800s and early 1900s. Forbush (1912) noted that a gunner of the period reported taking 340 snipe in a day's hunt with a friend and that they rarely bagged less than 150 per day during migration periods in Illinois. Ultimately, concerns for the future of shorebird populations elicited a total closure on hunting for nearly all species. A closure on snipe hunting was implemented for a 13-year period beginning in 1941. A limited interest in snipe hunting was renewed in 1954 but has not produced significant harvests. In Montana it is difficult to find a snipe hunter although some harvest is reported (Appendix, Table 1). As a result, bag limits have been generous by modern standards due to low hunter participation. The small size of the bird undoubtedly plays some role in the generous bag limits on snipe. In order for a hunter to put a meal of snipe on the table, a large bag and possession limit is needed.

Trends in Harvest and Hunter Activity: Appendix Figure 11 shows a limited harvest of snipe during the 1980s. Prior to that time snipe were hunted but no effort was made to enumerate harvest. The decline in snipe harvests from the late 1970s to the early 1980s probably resulted in part to the change from a mail questionnaire to telephone interviews for determining harvest. Because of the limited number of snipe hunters in Montana, it is difficult to determine the harvest with precision yet it's so small as to be considered insignificant. Tuck (1972) estimated the harvest rate on snipe in North America to be 1.1 percent. Based on natural mortality rates of this species, a much greater harvest could be allowed but is probably not warranted given the low hunter interest in snipe.

MOURNING DOVES

Population Estimation: Mourning dove breeding populations are surveyed on 25 trend routes across the state, primarily by non-Department personnel. The number of breeding doves censused in Montana is small in comparison to more heavily wooded prairie states to the south and east. Population survey data are summarized by the U. S. Fish and Wildlife Service's Office of Migratory Bird Management each year and recommendations made relative to the subsequent year's hunting regulations.

Hunting Seasons: Because the hunting of mourning doves is controlled by the U. S. Fish and Wildlife Service, Montana's

seasons must reflect guidelines set by international treaty. The Convention for the Protection of Migratory Birds signed by the President of the United States on September 1, 1916 provides for a closed season on the taking of migratory birds from March 10 to September 1. As a result of this convention, the United States and Canada cannot permit the opening of any migratory bird season earlier than September 1. State law further requires that "the open season on mourning doves shall be restricted to the open season on upland game birds..."; Section 87-2-101(7) M.C.A.

Because doves migrate from north temperate states before September, most states permitting dove hunting open their seasons at the earliest opportunity, usually September 1, whether that date falls on a weekend or not. Montana is especially prone to having its doves migrate prior to the season opening. As a result, in order to provide any dove hunting opportunity in most years, the season must open September 1.

The season closing date is determined by the length of season provided by the federal frameworks. In Montana, a 60-day season is permitted if a 15-bird daily bag is selected. If the season opened on September 1, this would result in an October 30 closing. After October 1, only limited numbers of doves still remain in the state. However, since the dove season closes before all other bird seasons, there is no apparent impact on private landowners in leaving it open a full 60 days. Small pockets of birds do persist even into November in areas where excellent feeding opportunities and roosting areas occur near migration routes.

Daily Bag and Possession Limits: Because Montana selects a shorter season than do southern states, the maximum daily bag and possession limits, 15 and 30, are permitted. These generous limits afford ample harvest opportunity if hunters are able to find a concentration of birds to hunt.

Trends in Harvest and Hunter Activity: In 1983, the Montana legislature enacted legislation permitting the Department to establish the first season for taking mourning doves in recent times. Because a hunting tradition for doves didn't exist, hunter interest in hunting doves in Montana was limited. Opportunities to take doves were also limited especially the first year since the dove season was opened with the waterfowl season on October 1. Practically no harvest occurred that year.

Beginning in 1984, the Commission opened the dove season with the upland game bird season which was provided by the legislation. This has occurred every year since 1984, which has meant that the dove season has opened as early as September 1 in some years and as late as September 8 in others. The desirability of opening the dove season as early as possible has prompted some Department personnel to recommend upland game bird season opening dates which are typically earlier than the traditional Saturday after Labor Day

(Watts and Feist, 1985). This has caused concern to some managers who have experienced declining activity at opening day check stations. Cross (pers. comm.) cited conflicts with other family outings when bird seasons open on Labor Day weekend, making it difficult to contact a large number of hunters at check stations and to gather a large sample of wings for the wing survey.

Since 1984, dove harvests have increased steadily with the exception of 1988 (Appendix, Table 1 and Figure 12). In that year, the opening of the season was delayed due to extreme fire danger experienced throughout the state. Delaying the season effectively eliminated most dove harvest opportunity that year.

As a result of steadily increasing harvests since 1984, doves during the period 1985-89 constituted two percent of the total upland bird harvest in the state (Appendix, Figure 13). This increasing harvest reflects not only a slowly growing tradition for dove hunting in Montana but also the trend to earlier openings of the bird season to maximize dove hunting opportunity. It is expected that as interest in dove hunting increases in Montana, harvest will continue to increase providing seasons open early. To take greatest advantage of this opportunity, dove seasons should open September 1. Under current law, this means that the upland bird seasons must also open on September 1. If opening upland bird seasons on September 1 is not acceptable, legislation should be introduced (as it was in the 1989 session) to allow the Department to set dove seasons independent of other bird seasons.

The majority of the dove harvest in Montana occurs in Region 7. Here larger numbers of birds are present after most doves have departed other parts of the state. Pockets of doves are present in major river valleys in other parts of the state, particularly in the Missouri and Milk River drainages. Late concentrations of doves in these areas in some years permit good dove hunting in very localized areas around Great Falls, Townsend, Malta, and Glasgow.

Mourning doves ranked seventh in the top ten most common breeding birds in the United States from 1966 - 1989 (Droege & Sauer 1990). The annual harvest was estimated by Keeler et al. (1980) to be nearly fifty million birds. Because of the early migration of doves, Montana will probably never be a major harvester. Yet by setting the upland bird and dove seasons to open on September 1, in some years, Montana hunters will be afforded harvest and gunning opportunity which no other upland game bird species provides.

GENERAL CONSIDERATIONS

Effect of Harvest on Populations: There currently exists no documented evidence that the harvest of game birds in Montana has had a detrimental effect on populations. It is likely that the variety and comparative abundance of upland game birds, the extent

and quality of their habitats, and the sparse hunter population prevents overharvest on any but an extremely localized basis.

With every species, documented annual turnover rates based on banding and population studies indicate a minimum annual turnover rate of 45%, and more typically, in the range of 60-75%. Studies conducted in Montana and elsewhere show a hunter-caused mortality of 3 to 30%, far below the natural mortality these populations experience. Brown (1971) reported sharptail mortality on year-round habitat units of 40-100 square miles ranged between 5 and 30 percent of fall populations with current hunting pressures. On these same areas 65-75% of breeding populations were lost each year to all causes. This study as well as all others reviewed for this report indicate that hunter-induced mortality is more than compensated for by natural mortality.

Effect of Regulations on Harvest: Studies referenced in this report which have addressed regulations' effects on harvest, have shown that regulations such as those in effect in recent years do little to control harvest. As Watts and Feist (1985) pointed out, season length is intended to control harvest, bag limits to equitably distribute harvest among hunters, and opening date to strike a balance among a variety of factors.

Bag limits, based on Montana check station data, exceed the average hunter's daily bag anyway, and as such, do not limit the average hunter's harvest. Similarly, upland bird hunters in Montana haven't conclusively been shown to fall short of achieving their daily bag or possession limit because other hunters took their share.

Throughout the literature it has been demonstrated that the majority of upland bird harvests occur during the first few weeks of the season. Upland bird seasons in Montana in recent years have run for several months, providing additional hunting opportunity but adding little additional harvest.

The timing of the opening date potentially represents a means to produce a large harvest on that date. The other two factors Watts and Feist (1985) cited in reality do not control the season's total harvest. Weather, economics, number of birds present, hunter numbers, road conditions, hunter access, social and other factors do determine the season's harvest.

Wallestad (1975) maintained that the total harvest in a given season varied with the success on opening day and that the law of diminishing returns guarantees breeding stock for the coming year. When hunting becomes unproductive, there is an automatic tendency for hunters to stop hunting. Mussehl et al (1971) agreed, citing the human trait of matching effort against yield as being more instrumental in controlling upland game harvest than season lengths and bag limits.

Literature referenced in this report suggests that Hoffman's (1983) recommendations regarding the effect of the regulations setting process on upland bird harvest and management in Colorado are appropriate in Montana as well. He stated that although harvest can be predicted using production indices and numbers of hunters, from a management standpoint, this relationship has little practical importance. Because spring densities are not affected by the previous fall's harvest, and because only a small portion of the fall population is removed each year, there is no reason for managers to collect breeding and production data to justify hunting seasons. In Colorado as in Montana, grouse (upland game bird) hunting regulations are reviewed annually, a task that requires considerable time and manpower. Often the regulations vary from year to year, adding to the confusion of the hunter. Hoffman suggested that the regulations process should be simplified through setting liberal seasons, standardized dates, and generous bag limits.

Department Mission: Mussehl and Howell (1971) wrote "Montana's small game management program is based on the knowledge that game bird populations experience a high annual natural loss. Game birds suffer a high death rate which is compensated by a high reproductive rate. Each breeding season produces surplus birds which will not live until the next breeding season." They also wrote, "A wild population, naturally short-lived, does not lend itself to stock-piling over to the next year."

These realities serve as the basis upon which each of Montana's hunting seasons is based. A problem arises in defining what represents "surplus" versus "breeding stock" in the minds of those responsible for establishing regulations. Research and surveys referenced in this report clearly show that hunters have been unsuccessful in utilizing that surplus and in most cases fall far short of that amount. In no instance has it been shown that breeding stocks have been impacted by regulations enacted in the last 60 years or more.

In general terms, the Department's mission is to provide the maximum recreational opportunity that wildlife populations provide while ensuring the perpetuation of those resources for future generations. The art of managing these wildlife populations comes in deciding how to provide that recreational opportunity. Falling short of realizing maximum opportunity constitutes lost opportunity. Examples of unrealized potential in upland game bird hunting in Montana are many.

Hen pheasant hunting is a potential area of additional opportunity which is not utilized. Dahlgren (1970) pointed out that even though protected in South Dakota, 9-13% of the hens fall victim to the gun. Other studies in Minnesota (Buckmann, 1967) and in Wisconsin (Wagner et al. 1967) have shown hunter-caused mortality of hen pheasants ranging from 6-16%. Presumably nearly all of this

hen mortality is left in the field. Further, based on studies in Montana (Weigand, 1973), legal hen harvests could be at least three times what is cited as illegal kill in these other states. Weigand (1973) pointed out that Montana lacks the hunting pressure necessary to harvest the entire annual surplus of pheasants, cocks or hens.

Wildlife managers and other department personnel admit that there is little public support for hen pheasant hunting in Montana. In order to develop such support, a time-consuming and expensive educational campaign would need to be implemented on a continuing basis. Managers do not feel that such costs are justifiable. Rather than investing time in such an educational campaign, managers will better serve the pheasant resource and its users by improving pheasant habitat.

Another area of underutilized recreational opportunity relates to opening dates for upland bird hunting. Montana's upland bird studies show that the peak in bird populations occurs sometime after the peak of hatch and begins to fall rapidly thereafter. Wallestad (1975) pointed out that 56 percent of the annual sage grouse mortality occurred during the time from egg-laying until the opening of the hunting season. Each day's delay in opening the season represents an additional loss of birds to natural mortality. Watts and Feist (1985) pointed out that it is prudent to open upland game bird seasons as early as possible while numbers of birds are still relatively high. Delaying the season until birds reach adult size or waiting until some traditional opening date reduces the number of birds that will be available to hunters on opening day.

Weigand and Janson (1976) pointed out that because of cumulative mortality more pheasants are available to hunters in early October than at any later time. Waiting to open the season until the majority of cock pheasants have adult-like plumage so that hunters can easily differentiate sexes represents a waste of harvest opportunity that could be utilized if the pheasant season were to open on October 1. Hunters wishing to wait until birds became older and more brightly colored could do so.

Weigand (1982) pointed out that partridge populations in Montana are grossly underutilized; that they could endure annual harvests 10 times their current level. Consequently, even more liberal bag limits and even longer seasons could be provided for huns than are currently provided. Although only a few hunters would take advantage of these increases, some additional increment of hunting opportunity would be realized. Studies on other upland bird species in Montana show that additional harvest via longer seasons and more liberal bags are consistent with the additional harvest which these populations could withstand and would provide more recreational opportunity for at least a portion of the hunter population.

Although check station data indicate that the typical opening day hunter takes an average of from 1 to 2 birds, the daily bag is usually at least 3 birds for one species. Watts and Feist (1985) pointed out that 3 is the minimum limit below which there is probably little incentive to go hunting while 6 birds is probably the maximum. Hungarian partridge bag limits have been raised to 8 birds since that article was written and some hunters in the better partridge areas of the state have taken daily bags of 8 birds. This indicates that in boom years, higher daily bag limits may be appropriate.

The possession limit was first imposed to curb market hunting of waterfowl in the United States (Weigand and Janson, 1976). It was then extended to other small game. Yet it has not been shown to limit the harvest of upland game birds. It's greatest limitation may be for nonresident hunters, setting a limit on the number of birds that can be transported out of state. For resident hunters the possession limit probably only penalizes the most avid hunter. Were such a hunter to realize a daily bag limit every day of the hunting season, it is unlikely that he would reduce harvest opportunity for other hunters at the current levels of hunting. More recreational opportunity would be provided our most avid hunters if the possession limit was removed or set higher.

Mussehl et al. (1986) listed objectives for harvest, number of hunters, and hunter days of recreation provided by the year 1990 for each major group or species of upland game birds. These figures were projected in 1985 and represent increases from harvests prior to that report. In reality, during the 1985-90 period, the harvest and number of hunters have either declined or remained at a level similar to that during the late 1970s and early 1980s for most species (Appendix, Tables 1 and 2). As a result, objectives outlined in the strategic plan haven't been realized. Notable exceptions are hungarian partridge and Merriam's turkey.

Lonner et al. (1990) suggested that although a variety of factors have been suggested as determinants of harvest, that habitat change, including that resulting from weather phenomena, has greatly influenced upland game bird populations and harvest survey results. Weigand (1982) indicated Hungarian partridge are benefitted by drier than normal conditions, as a dry spring results in early nesting and above average production. Drought conditions have typified most of eastern Montana during the 1980s, which has affected the greater than average abundance of huns across most of the area. As a result, the harvest of huns in 1987 actually exceeded the objective in the strategic plan.

The mild winters of the 1980s which have contributed to the drought in Montana have also probably improved over-winter survival of Merriam's turkeys, permitting their numbers to increase through pioneering new habitats. Harvests have increased as a result. The strategic plan (Mussehl et al. 1986) sets a turkey harvest

objective of 2,975 birds which was exceeded in the past two hunting seasons (Appendix, Table 1).

In contrast, species like sharptails do poorly during dry years, which accounts for their comparatively low harvests and low population levels in most areas during much of the 1980s. The objective for sharptail harvest by 1990 is set in the strategic plan at 98,700 birds. The most recent five-year harvest averaged approximately 45,000 birds. These comparisons demonstrate the role of weather and habitat-related influences on upland game bird populations and harvests in Montana and point out the difficulty for the department in realizing its goals in the face of factors which it can't control.

Mussehl et al. (1986) outlined possible strategies to enable the department to reach its goals. Using mountain grouse as an example, the plan recommends promoting grouse hunting away from congested forest roads and after the early season concentration of hunters subsides. For turkeys, it recommends that the department seek improved understanding by the public to allow a portion of the turkey population being harvested each year while still sustaining ample breeding stock and turkeys for year-round viewing. Chrest (1968) suggested that because there is substantial annual turnover in blue grouse populations and hunters are not making full use of these birds, department personnel should make every effort to tell hunters about areas with good blue grouse populations.

This approach to realizing the Department's mission of maximizing recreational opportunity through promoting hunting and harvest is viewed by some as an inappropriate approach to wildlife harvest management. These people contend that if a need does not now exist, why should the department attempt to create one through promotion? The answer in part lies in the Department's realization over the years that once an opportunity is provided, hunters are usually quick to take advantage of it. In so doing, hunters are providing the revenue source needed to finance habitat programs, the benefits of which are reaped by all Montanans and persons visiting Montana, regardless of whether they hunt or not. Braun and Beck (1983) in discussing the value of more liberal sage grouse seasons in Colorado stated that wildlife agencies should consider all possible recreational uses that do not negatively impact overall population size. By encouraging consumptive uses of this resource it may be possible to prevent further losses of the sagebrush ecosystem. Experience has shown that if hunters develop an appreciation for a species, a particular hunting area, a type of hunting season, etc., they begin to identify with it and to feel a sense of ownership in it. As a result, they become more prone to becoming involved in its perpetuation for the future.

Critics of hunting programs view wildlife managers as exploiting a public resource while making hunting more lucrative. The reality in Montana is that although increased hunting opportunity may

result in more licenses sold and more money raised, these funds are not used to make the department richer. Much of the funds raised through the sale of upland game bird licenses are earmarked to improve habitat for upland birds, which in turn reduces soil erosion, improves water quality, increases aesthetic values in the area, and produces other benefits to everyone living here. As a result, striving to reach department goals while appearing to some to be exploitation is, in the department's view, utilizing an abundant, annually renewable resource while preserving in perpetuity many natural values.

Hunter Satisfaction, Expectations, Needs: Beyond what biologists recommend based on the science of wildlife management are other factors which come into play which reflect what hunters expect in terms of harvest opportunity. These expectations in the past have resulted in compromises in what was the most scientific approach to harvest management realizing the potential of a bird population to sustain a substantial harvest.

Hunters' expectations of upland game bird seasons, bag limits, and other regulations often reflect what they perceive to be their needs or wants from the sport relative to the role it plays in their lives. The outcome is measured at the close of that season by their relative feeling of satisfaction with that year's experiences afield.

One of the greatest factors affecting hunter satisfaction is the daily bag limit. The ability of the average hunter to achieve his or her daily bag largely determines what that bag should be since many hunters want a bag which they can realistically achieve in a day. If the limit seems too high to most hunters they are certain to convey that to the Department or the Commission. Weigand and Janson (1976) wrote that the belief that daily bags are set to correspond to population levels is a common misconception among hunters. Weigand and Janson state that it is an attempt to distribute the harvest between hunters. However, check station data show that the average hunter takes only one or two pheasants on opening day. As a result a bag limit of three is generally set so that most hunters can approach or achieve that level.

All upland bird daily bag limits in Montana are set higher than the hunters' actual average daily bag. Having a bag limit which is somewhat difficult for most hunters to attain seems acceptable because of the possibility that they might achieve it even though the reality is that the average hunter doesn't. In addition, a liberal bag affords the hunter who is willing to put forth extra effort and/or who lives in an area where birds are comparatively more plentiful the ability to take more birds than the average hunter. The Department while strongly supportive of the biological basis for liberal bags, recognizes that the majority of hunters must be satisfied with the outcome of their season or they may stop hunting. A compromised bag limit representing a liberal estimate

of what hunters across the state can take in a daily bag for that species seems appropriate. In boom years when birds are abundant, the bag limit could be increased from that base level since the average hunter will take more birds in such a year.

Hunters' needs relative to a bag limit are probably reflected by Watts and Feist's (1985) contention that 3 was probably the minimum acceptable bag for grouse. Stated differently, hunters may need to justify to themselves that in order to make the effort and absorb the expense of a trip to hunt upland birds, they should be able to take at least 3 of a species per day. Evidence for this rationale lies in the Central Flyway drake mallard bag limit of 2 birds. Some Montana hunters surveyed during winter meetings on the upcoming seasons have indicated that they quit hunting ducks because regulations, including the bag limit, were too restrictive to justify the effort and expense of hunting ducks. In many of these hunters' recent memories is a season length of 83 days and a drake mallard bag of 5, compared to the present day when the daily bag limit has been reduced to 2 and the season length to 51 days.

Because at least some hunters believe that the daily bag limit is a tool to bring harvests into line with population levels, it is no surprise that they expect that bag limits and seasons should be reviewed annually in response to different habitat conditions, weather conditions, and bird population levels. In a drought year the expectation of some hunters will be shorter seasons and/or lower bag limits. To leave the same bag limit and season length in effect from the previous year without some explanation will leave such hunters with the notion that the department's upland bird harvest program is irresponsible and unresponsive to the resource's needs. On the other hand, if spring bird censuses and rainfall patterns indicate that it will probably be a good production year for upland birds, some hunters may expect more liberal regulations. Since establishing a base season and bag limit with liberalizations in boom years is what this report will be recommending, a concurrent commitment on the part of the Department will be necessary to inform hunters as to what base regulations will be, what liberalizations will be implemented in boom years, and why.

An unwritten law in the world of hunting regulations is that regulations should be simple, straight-forward, easy-to-read, and easy to interpret. The Department has been criticized in the past for developing hunting regulations which are far too complex for the average person to follow and interpret readily. Some of this criticism has been deserved reflecting the Department's reluctance to develop regulations that apply over a broad area. Taking advantage of a variety of areas and/or species to hunt has in the past exposed some hunters to a confusing array of bag limits, season opening and closing dates, closed areas, and shooting hours. The results from the department's viewpoint have probably been negative as hunters around the state experienced citations for violations; stopped short of their bag for fear of overbagging; or

perhaps stopped hunting for fear of violating or just to resist being "over-regulated".

In realizing that complex regulations will elicit negative results in the hunting public, the Department has strived for more simplified regulations. This is particularly important with upland birds where a dozen species are involved. A single statewide opening date for grouse, partridge, and doves is a positive step in that direction. Identical closing dates should also be developed statewide. Bag limits should be standardized.

The benefits of setting regulations for a period of years as opposed to annually would outweigh the resulting need to educate hunters, landowners, and other members of the public about the reasons for not changing regulations annually. For example, confusion and the effort hunters needed to put forth to stay abreast of regulations changes between years would be minimized. Weigand (1978) suggested that one approach to reducing apprehension regarding bird seasons opening and fire danger would be for the Commission to adopt a single standard opening date for all grouse seasons, allowing for changes if fire hazard conditions dictated. He added that a single standard opening would facilitate landowner/recreationist relations by allowing both to plan ahead for opening weekend.

One expectation that hunters have of the regulations process is that the Department will send biologists out into the field to survey populations to determine what the prognosis is for the upcoming hunting season. This is typically manifested by numerous phone calls and correspondence contacting the Department wanting to know what sort of hunting season is projected. Some biologists, wanting to be able to answer these questions so as not to disappoint the person making the inquiry, feel that surveying the breeding populations is imperative. Some feel it must be done so that it appears that the Department is responsible and professional in its approach to harvest management.

The objective of doing spring breeding surveys has traditionally been to gather trend information on breeding populations and on the basis of these data, make recommendations to obtain a maximum harvest without endangering the breeding population (Chrest, 1968). Most managers now state that their regulations recommendations do not now reflect their data collections; that in fact, there is no correlation.

Some managers feel that the Department needs to collect the data on breeding populations and harvests so that managers have at least an indirect measure of population trend. They view this information as crucial so that if populations decline drastically, the Department is able to refute arguments that a closed season or some other drastic action must be taken. Eng (Pers. comm.) feels that having a flat set of regulations which do not change over the long

term will not be well received by the public. In his view monitoring populations and taking advantage of "bonanza years" with more liberal regulations presents a more professional picture of the department's regulations setting process.

Weigand (pers. comm.) contends that in order for hunters to continue enjoying hunting upland game birds, biologists will need to continue annual evaluation of populations in a scientific manner. He wrote, "there is no safe substitute for biological data collection and analysis in managing...grouse." This contention seems to fit the sportsmen's joint expectation of the department's role in the annual regulations process yet doesn't agree with most managers' admission that these data though collected annually are not used in making regulation recommendations.

Habitat is the bottomline for the Department in terms of its upland game bird program. The history of the ring-necked pheasant in Montana as described by Weigand and Janson (1976) is a classic example of this relationship. Pheasants were introduced into the state in the early part of this century and rapidly expanded to fill suitable habitats. They became abundant, in some areas to the point of causing farmers consternation over crop damage. Hunting seasons produced harvests the likes of which haven't been seen in the past four decades. The late 1930s and early 1940s saw mild climatic conditions and vast acreages of agricultural land retired from cultivation overgrown with weeds. Enough grain was grown to provide winter food. Farming practices permitted large crops of weeds and insects; shelterbelts and trees were planted. Pheasant populations exploded. Since then agricultural practices have changed and habitat has declined. From 1950-65 there was a steady decline in cropland acreage. Alfalfa production has increased as has livestock production. Pesticide use to control weeds and insects in agricultural fields has increased. Winter food has been limited in some areas due to fall plowing, stubble burning, and other practices.

Pheasant populations have steadily declined and now fluctuate around a low level, responding annually to changes in winter conditions, spring precipitation, and a variety of other factors. Through all this the Department and the Commission have tried a variety of bag limits, sex restrictions, season lengths, and other regulation changes. Yet the overriding influence determining the outcome of some 62 hunting seasons has been the number of pheasants that the habitat base present in the state during that period would support.

Present day proof of that fact lies in the impact of the Conservation Reserve Program (CRP) on pheasants and their habitats. Mule' (Pers. Comm.) reported that the CRP program has resulted in the establishment of over one million acres of bird habitat in Region 6. This habitat has expanded pheasant distribution in that region and is expected to benefit sharptails and huns as well. The

bottomline is that there are now viable pheasant populations in areas where there virtually none a short time ago. Similar changes in pheasant numbers and distribution have occurred in other parts of eastern Montana. The message is clear: if you want to have and to harvest more pheasants, you need to create more habitat.

This relationship holds true for all species of upland game birds, but because of the insidious nature of longterm habitat change, often escapes the untrained eye. Eustace (Pers. comm.) stated that during the early 1900s, fires ravaged the forests of the Beartooth Face near Red Lodge. These burn areas were eventually repopulated with aspen. Ruffed grouse flourished in these areas and harvests increased. Now, these aspen stands are decadent. The grouse and the trees on which they partly depend, are slowly fading out of the picture.

Wallestad (1975) said that the primary factor affecting sage grouse populations is the quality of sagebrush habitat. Nesting success and production of young are directly related to habitat quality. Both factors are important in affecting fall population size and hunter success. Harvest management according to Wallestad is less important than management of sagebrush-dominated rangelands. Mule' (Pers. Comm.) pointed out that sage grouse harvests have steadily declined in Region 6 over the last two decades. He attributes this to habitat loss and a reduction in the quality of the remaining habitat due to current range management practices.

Cross (Pers. comm.) expressed concern that part of the decline in the harvest of spruce grouse, at least in Region 1, is due to declining habitat condition resulting from habitat modifications brought about to control mountain pine beetle epidemics. Joslin (Pers. comm.) also feels that timber management and road development in western Montana suggest that significant habitat change for mountain grouse is ongoing. Chrest (1968) felt that trend routes for mountain grouse needed to be established to monitor long term population change. The admonition in these biologists' comments is that breeding surveys or other population estimation and distribution surveys are imperative to monitor the extent and magnitude of what is perceived to be significant habitat changes. Unfortunately, very little of the ongoing data collection for upland game birds allows managers to determine exactly how long term habitat change may be affecting future populations.

Mussehl et al. (1986) pointed out in the strategic plan that dealing with habitat issues is the primary strategy for meeting the department's objectives for harvest and recreational opportunities. Martin (Pers. comm.) pointed out that the Upland Game Bird Habitat Enhancement Program in combination with land access programs are the route to realization of Region 7's goals for harvests of upland game birds. He feels that regulations should be set for the long term and that efforts should be funneled into habitat enhancement activities and gaining access to private lands for public

recreation. Martin suggested that this longterm set of regulations should represent a base level which meets the current expectations of the sportsmen and that our habitat programs, aimed at raising populations over the long term, would eventually lead us to more liberal regulations as we increase bird populations.

Landowner Tolerance and Expectations: During the 1989 hunting season the total harvest of all upland game birds in Montana was estimated to be approximately 255,000. Assuming that the majority (at least 75%) of the primarily agriculturally-related species were taken on private land and that a small proportion of the other species were also taken on private land, it is likely that over half, perhaps two-thirds of the upland bird harvest in Montana that year was taken on privately-owned lands. The implications of this fact play a major role in the latitude the Department and the Commission has in setting seasons and other regulations for upland game birds.

Landowner considerations relate ultimately to the availability of public hunting on private lands. The harvest objectives for the major upland game bird species outlined by Mussehl et al. (1986) will become impossible to achieve if private lands become inaccessible to the average Montana hunter.

For many landowners, hunting seasons represent an inconvenience affecting his ability to accomplish his work during the fall. For some it has meant property damage, being annoyed at home at odd hours, and in a few cases, mixing or even loss of livestock. In some areas, such as those having large numbers of pheasants, landowners become aware that hunters are a constant presence which they must deal with, particularly in areas where many hunters are travelling from outside areas to hunt. The net effect is often that the landowner would prefer to see the bird seasons shorter, or at least that they overlap with the big game season.

This landowner sentiment has been manifested in a variety of ways in the past relative to the Department's regulations process. For example, when the legislation was passed in 1983 enabling the Department to set a season on mourning doves, wording was included that the dove season must open with other bird seasons. For many years, upland bird seasons in much of eastern Montana closed when the big game season closed.

Although the Commission has allowed longer seasons in recent years, concerns about dealing with hunters for large portions of the fall are still very real in the minds of many private landowners. In Region 5 for example, Eustace (Pers. Comm.) admits that the spring turkey season in the Bull Mountains is basically set based on landowner tolerance for that hunt. Overall, landowners in that region strongly support shorter seasons, possibly in response to being close to the state's largest population center.

Northeastern Montana in recent years has become one of the most popular pheasant hunting areas in the state. In 1989, Region 6 had the highest pheasant harvest in the state. Nonresident hunters represent a large portion of the hunters in that area (Mule', pers. comm.) Private landowners who have good pheasant habitat and large numbers of birds are dealing with large numbers of hunters through most of the pheasant season, particularly October and November. (Mule' pers. comm.) reported that on one 500-acre farm, there were over 700 man days of hunting recreation, primarily for pheasants, during the 1989 season. With this degree of pressure, landowners' concerns over upland game bird seasons will increase.

Landowners and local hunters in Region 6 are concerned that the season is too long despite the fact that less than 10% of the hunting effort is expended during December (Mule', pers.comm.). Mule' recommends that to maintain a large amount of quality public pheasant hunting in Region 6, the Department must develop other areas of high quality pheasant habitat which are available to the hunter. To accomplish this, the Department would need to implement on a significant scale, the Upland Game Bird Habitat Enhancement Program and to tie those lands as well as CRP and other suitable habitats into block management units affording public hunting.

The inadvertent connection of these two programs in the northeastern portion of Region 6 last year resulted in the Department investing $8,700 in block management, primarily for pheasant hunting. This resulted in 4,600 man days of hunting recreation at a cost of $1.90 per man day of recreation or 41 cents per acre of land in the program.

Landowner tolerance for upland game bird hunting also relates to bag limits. As the bag limit is increased, so too is the amount of time that at least some hunters will spend afield trying to fill their daily bag limit. This potentially increases the number of contacts hunters will have with area landowners.

The possession limit is of even greater concern in some areas. In the northeast for example, a four-day possession limit makes it much more lucrative for nonresident hunters to hunt this area. As a result, a large percentage of the hunting recreation the area offers is going to nonresidents. Mule' (Pers. comm.) reports that the primary complaint he hears from local residents relative to bird hunters is the large number of nonresident bird hunters. In response, the region investigated the possibility of restricting nonresident hunters to a lower possession limit than resident hunters would be allowed. This differential possession limit was deemed by the Department's legal staff to be illegal.

The concern over nonresident bird hunters in Region 6 has continued. The region continues to look for ways to deal with it. The Block Management Program has alleviated some concerns, but the indication from trends in lands leased for hunting and increasing

acreages of other properties closed to the general public is that the demand for pheasant hunting in this area greatly exceeds the landowners' tolerance.

As outlined in the previous section, increasing habitat for upland birds in Montana is the answer to assuring healthy bird populations and maximum recreational opportunity for the future. The Upland Game Bird Habitat Enhancement Program is designed to accomplish those ends. The Program currently generates about $500,000 annually through earmarked funds from bird license sales. For the landowner who wants more game birds on his property and for whom numbers of hunters are not a big concern, it is a good program. But because the enabling legislation for the program requires that the landowner allow reasonable public access, for many landowners doing something for birds means having to deal with hunters. If habitat activities on his property are very successful and increased production of birds is the result, he is setting himself up for a greater influx of hunters asking permission to hunt. Enrolling this same landowner in the block management program or some other landowner incentive program designed to accommodate public hunting will compensate him at least in part for increased hunting pressure.

Another aspect of landowner tolerance of upland bird seasons is the real or perceived threat of fire danger which results from hunters on the land in the early fall. Weigand (1978) pointed out that establishing standard season dates long in advance of the season is an improvement over the traditional annual season-setting process which occurs during the driest part of the summer. Normal precipitation patterns indicate that in most of the eastern two-thirds of the state more precipitation does come by the end of August or early September. Even if precipitation does not occur, the Governor or the Commission have the legal authority to delay the opening of the season. County commissioners hold similar authority for closures within a county.

Opening dates and shooting hours for some seasons have been a point of contention with landowners in the past. Pheasant seasons opened for many years on Sunday noon. This was basically a concession to reduce opening weekend disruption for the landowner.

Many landowners, like many sportsmen, develop their own ideas of what the seasons, bag limits, and other regulations should be and how they should change from year to year. In the process of working on their ranches and farms and travelling through neighboring lands, they see birds (or don't see birds) and make comparisons with previous years. This in turn leads them to expect the department to respond to these changes in terms of that year's hunting regulations. In most cases they do not know or do not agree with the results of department surveys and upland game bird research. When their expectations for departmental response to that year's bird populations in its regulations are not realized,

they often become critical of the department. This ultimately induces some to take a conservative approach to setting seasons and bag limits on the lands which they control. Most often this means closing the area to hunting at least for some species.

CONCLUSIONS AND RECOMMENDATIONS

Based on the supporting information referenced in this report, it is clear that the Department as well as the Commission, have moved together through a period of tremendous change in upland game bird harvest management in Montana. Since settlement days, the numbers of birds, species present, and condition of bird habitats have changed drastically. Changes in regulations have followed this evolution in bird populations and their habitats. In most cases, decisions were made which more closely reflected landowner or sportsmen concerns than the realities of bird population dynamics.

Since 1985, the Department and the Commission have liberalized regulations, reflecting the knowledge gained from forty years of surveys and research. Some question whether that knowledge is still applicable given the habitat change that has occurred during those forty years. The fact remains that there currently exists no documented evidence in Montana or its neighboring states that hunting seasons, bag limits, and other current day regulations are depressing populations. It is in fact, the habitat base that should most concern us, and move us to "doing things for upland birds".

In order to make habitat enhancement, development, and preservation our guideposts for improving the upland bird picture for future generations, it is imperative to minimize the amount of energy, time, and money that is spent on activities which detract from reaching that goal. This is particularly true given the difficult economic choices with which the Department and most Montanans are currently faced.

Because annual tinkering with regulations detracts from progress toward habitat goals for upland birds, it is recommended that a set of regulations be adopted for the long term. With the exception of annual changes in some opening dates due to calendar changes and extreme cases requiring emergency action due to fire danger or other natural or man-made catastrophes, these long term regulations should be adopted and adhered to. Specifically, it is recommended that:

1) The mountain grouse, prairie grouse, partridge, turkey, and dove seasons open statewide on September 1. The dove season should close as late as federal frameworks permit. Seasons for grouse, turkey, and partridge should close December 15 statewide.

2) The opening season dates for common snipe in the Central Flyway and Pacific Flyway portions of the state should be the earliest which federal frameworks permit. Closing dates in each flyway should reflect the longest season permitted by the federal frameworks in each flyway.

3) The season for pheasants should open on the Saturday nearest October 15 and close December 15 statewide.

4) The spring season fur turkeys should open on the Saturday nearest April 10 and close thirty days later.

5) Shooting hours for all upland game birds should be one-half hour before sunrise to one-half hour after sunset.

6) The daily bag and possession limits for mountain grouse should be five daily and twenty in possession in aggregate statewide.

7) The daily bag and possession limit for sharptails and sage grouse should be 4 birds daily and 16 in possession of each species statewide.

8) The daily bag and possession limit for doves and snipe should be the maximum that federal frameworks allow.

9) The daily bag and possession limit for partridge should be 8 and 32, respectively, both species in aggregate statewide.

10) The daily bag and possession limits for pheasants should be 3 birds daily and 12 in possession statewide. Although hen shooting is desirable in terms of realizing maximum recreational opportunity, it is not recommended given the educational effort it would require.

11) The legal means of taking each species, including mountain grouse, be maintained as provided by current statutes and Commission regulations.

12) The area open to the taking of each species should be the same as those recommended in the 1990 upland game bird regulations except for turkeys

13) Areas where turkeys currently occur that are not now open to spring and fall turkey hunting should be added to the maps of areas open to general or permit-only hunting by 1993. New areas into which turkeys are either introduced or naturally pioneer should be opened to hunting no later than three years after their introduction or appearance in those areas. Areas currently open to turkey hunting by permit should be included in areas open to general hunting as soon as numbers reach suitable levels or in 1993 whichever occurs first.

14) Falconry seasons should run September 1 through March 31, except for doves and snipe which should be the same as for gun hunters. Bag limits should be 2 daily and 8 in possession. Falconry hours should be one-half hour before sunrise to one-half hour after sunset.

15) Non-toxic shot should not be required as a general regulation for upland game bird hunting although its voluntary use should be encouraged.

Recommendations 1) - 15) should be regarded as the base level recommendations for regulations. In years when improved habitat conditions produce noticeable increases in populations, regulations should be liberalized, primarily through increases in daily bag and possession limits. At the present time, the abundance and distribution of turkeys in Region 7 suggests such conditions exist there. As a result, the commission should consider increasing the bag limit to two in the fall season, provided a companion effort is initiated to generate landowner support.

It is further recommended that:

16) The Upland Game Bird Habitat Enhancement Program and the Block Management Program be recognized as complementary programs which must be coordinated in each region to maximize the benefits of the two programs. All regions should have completed goals for these two programs for their full implementation by 1995.

17) Legislation should again be introduced to eliminate the requirement for the mourning dove season to open with other upland game bird seasons.

18) Regional Wildlife personnel and Helena staff develop a plan to meet the Department's needs for its upland game bird management. Specifically, in addition to ongoing habitat Enhancement Program activities, decisions must be made relative to what bird population surveys, harvest surveys, research, and other activities are needed.

The Department recognizes that implementing these recommendations is a major challenge. Because they reflect sound resource management, they should be the starting point for all future regulations discussions. The Department recognizes that political, climatic, or social concerns may dictate that the Commission deviate from these recommendations. However it is the Department's position that adhering to these recommendations best represents the long term welfare of the upland game bird resources of Montana.

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APPENDIX

Table 1. Harvests of upland game birds in Montana: 1952-1989

Years	Pheasant	Sharptails	Huns	Ruffs	Blues	Sage Grouse
1952	257800					
1953	171806					
1954	392630					
1955	-0-					
1956	-0-					
1957	231013					
1958	174882	40715	77000	28766	32306	18587
1959	157192	35664	42000	32941	28928	23150
1960	169351	37918	49000	44403	51646	33876
1961	190331	36270	37000	72772	50616	27364
1962	309807	31826	45000	85642	58996	32572
1963	358015	85363	111000	60731	53229	72363
1964	107190	107232	164000	62794	63402	99138
1965	221130	49220	40520	48740	46560	30030
1966	97108	140585	123530	50740	59605	56740
1967	95196	79054	70622	67465	50971	29493
1968	114528	66825	70157	44686	40638	29581
1969	96303	99776	69088	38763	40980	54201
1970	90643	73030	49563	36694	38036	36880
1971	68138	78549	36600	34348	30454	40574
1972	48402	76544	32626	50014	41186	43067
1973	58636	89741	40620	61492	64312	45994
1974	87752	81355	45186	43456	49928	39120
1975	102254	87084	56446	47406	49157	44982
1976	102211	137333	103904	38019	51344	50823
1977	106485	95213	103935	54678	52601	34725
1978	100063	96272	93043	56365	55789	43597
1979	98941	121781	62063	81350	78375	66398
1980	99656	75224	46401	24956	40418	34589
1981	163499	56026	29940	17059	31262	26680
1982	104880	47874	24966	23268	30076	22382
1983	163499	90378	39799	39422	36370	42870
1984	104880	63168	34768	24682	21564	22972
1985	43231	33566	21457	27325	24432	10791

1986	41724	31846	20728	30184	24886	12686
1987	74028	71629	89483	41430	35678	28578
1988	77880	50028	64157	27885	21563	18878
1989	85013	36240	52131	25688	22429	16178

Years	Spruce Grouse	Chukars	Turkeys	Doves	Snipe
1958	11506		89		
1959	12642	200	375		
1960	26070	600	193		
1961	27018	800	409		
1962	37832	2000	370		
1963	31807	3000	993		
1964	44783	4500	626		
1965	25790	2050	950		
1966	33685	3995	618		
1967	35548	2400	297		
1968	21720	3200	411		
1969	19455	3000	360		
1970	20122	1327	251		
1971	17200	2260	547		
1972	24772	2253	444		
1973	34685	1379	476		
1974	28740	1761	872		
1975	23714	1141	938		
1976	18636	1586	805		
1977	24710	1853	856		
1978	25186	2578	1385		
1979	31580	2338	1970		881
1980	9714	888	2105		827
1981	5496	1024	1552		142
1982	6280	1039	1695		213
1983	8225	1421	1800	450	350
1984	5948	446	2182	3974	148
1985	5925	432	1725	4920	245
1986	6139	392	1732	5292	105
1987	9210	813	2272	6172	105

1988	5864	1285	3837	2135	37
1989	5503	1133	4173	6927	133

Table 2. Number of upland game bird hunters and hunter days of recreation during fall hunting seasons in Montana;
1960-1989.

Year	Number of Hunters	Number of Hunter Days
1960	71,860	NA
1961	59,213	--
1962	74,798	--
1963	86,262	409,650
1964	86,646	475,687
1965	86,116	--
1966	83,753	--
1967	46,712	--
1968	48,548	--
1969	50,842	--
1970	41,478	--
1971	34,348	--
1972	39,500	--
1973	46,239	--
1974	43,384	--
1975	46,419	294,444
1976	47,160	343,796
1977	50,443	357,136
1978	48,656	345,458
1979	51,247	392,235
1980	NA	--
1981	37,459	270,153
1982	36,594	256,788
1983	46,805	365,318
1984	35,986	266,694
1985	30,767	200,555
1986	23,664	199,867
1987	29,265	345,867
1988	32,999	190,631
1989	33,409	198,846

*Estimates of hunter activity prior to 1975 and for 1980 are not available. Prior to 1981, hunter numbers shown are primarily residents only (nonresidents represent a small percentage of the total number of hunters in those years)

Table 3. Number of upland bird hunters by species in Montana during the 1989 hunting season.

Species	Number of Hunters
Ring-necked Pheasant	13,520
Hungarian Partridge	7,041
Sharp-tailed Grouse	7,171
Blue Grouse	5,437
Ruffed Grouse	5,310
Sage Grouse	3,866
Spruce Grouse	1,685
Mourning Dove	674
Chukar Partridge	226
Common Snipe	55

Number of turkey hunters is determined by a separate survey; data presently unavailable.

115.3

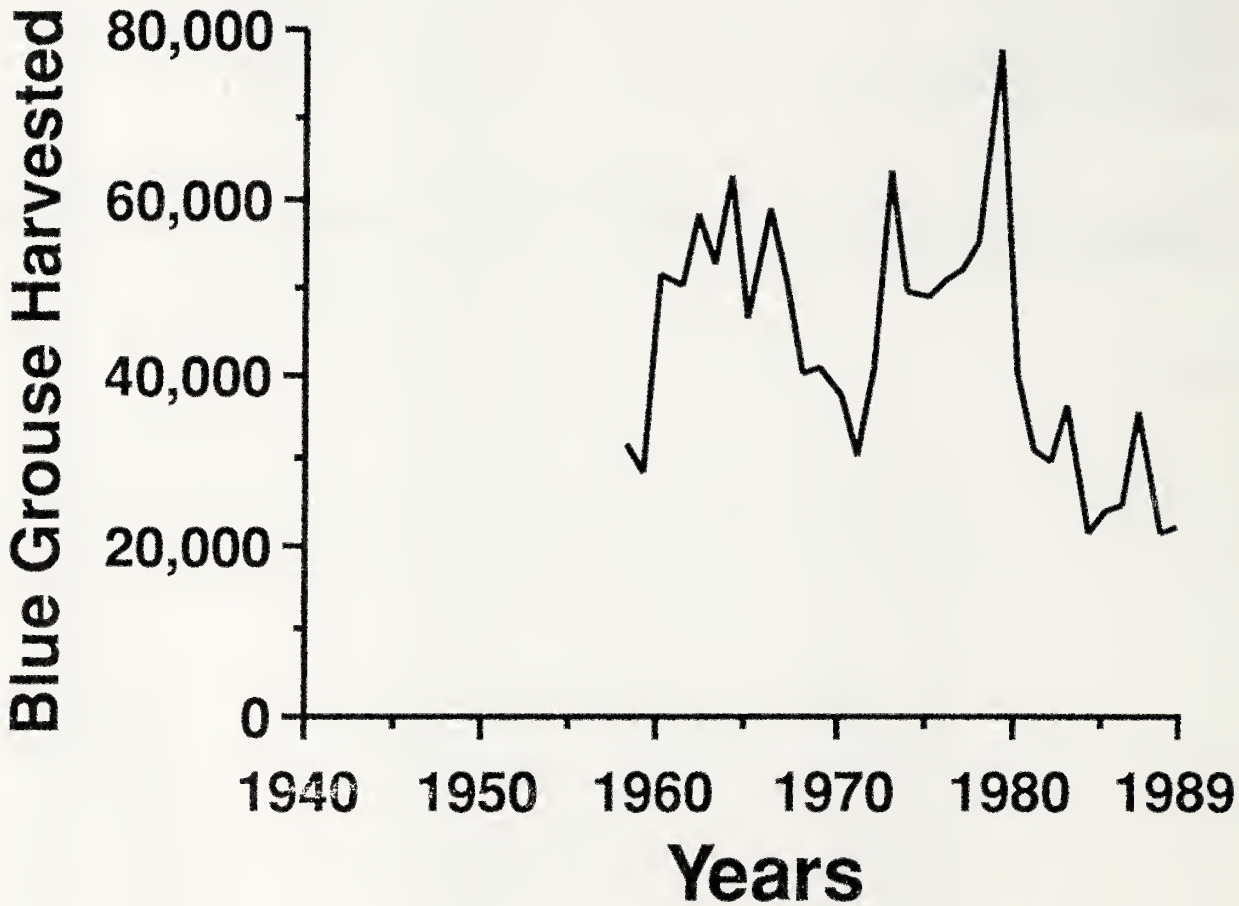


Figure 1. Blue grouse harvests in Montana; 1958-1959.

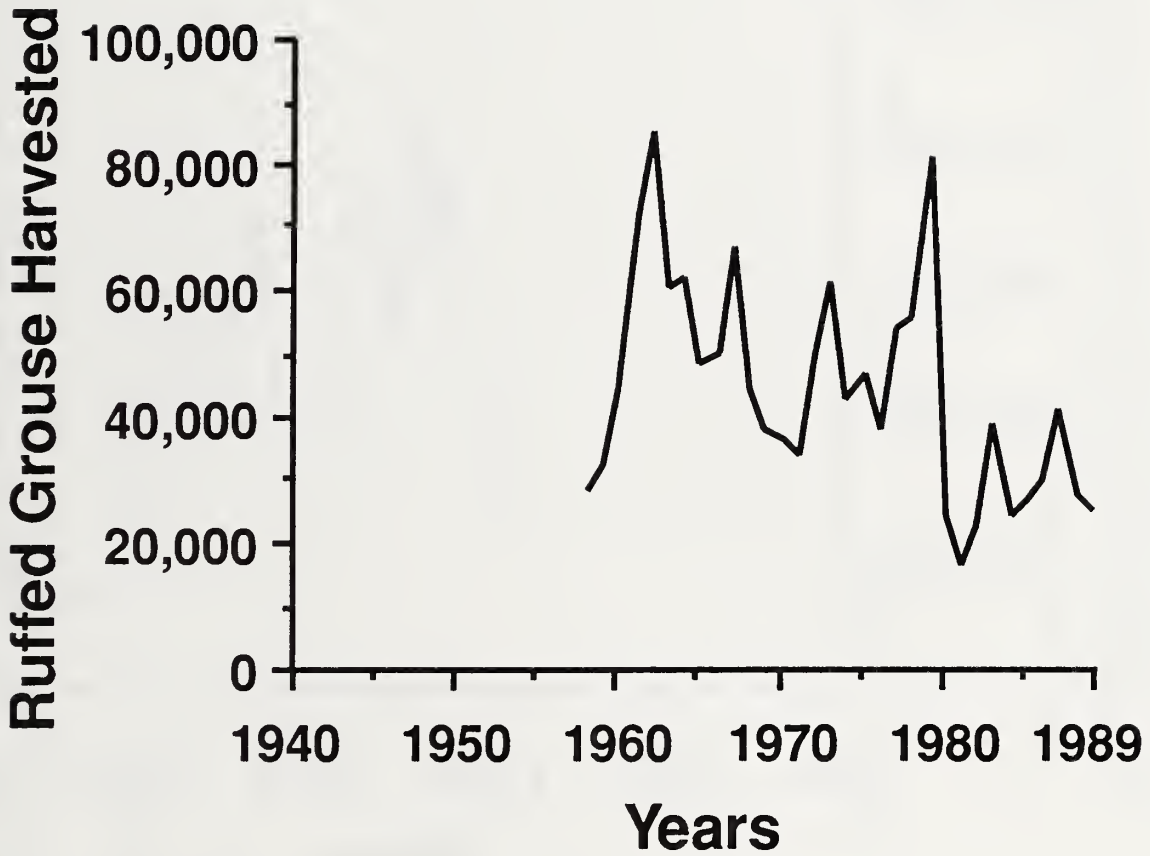


Figure 2. Ruffed grouse harvest in Montana; 1958-1989.

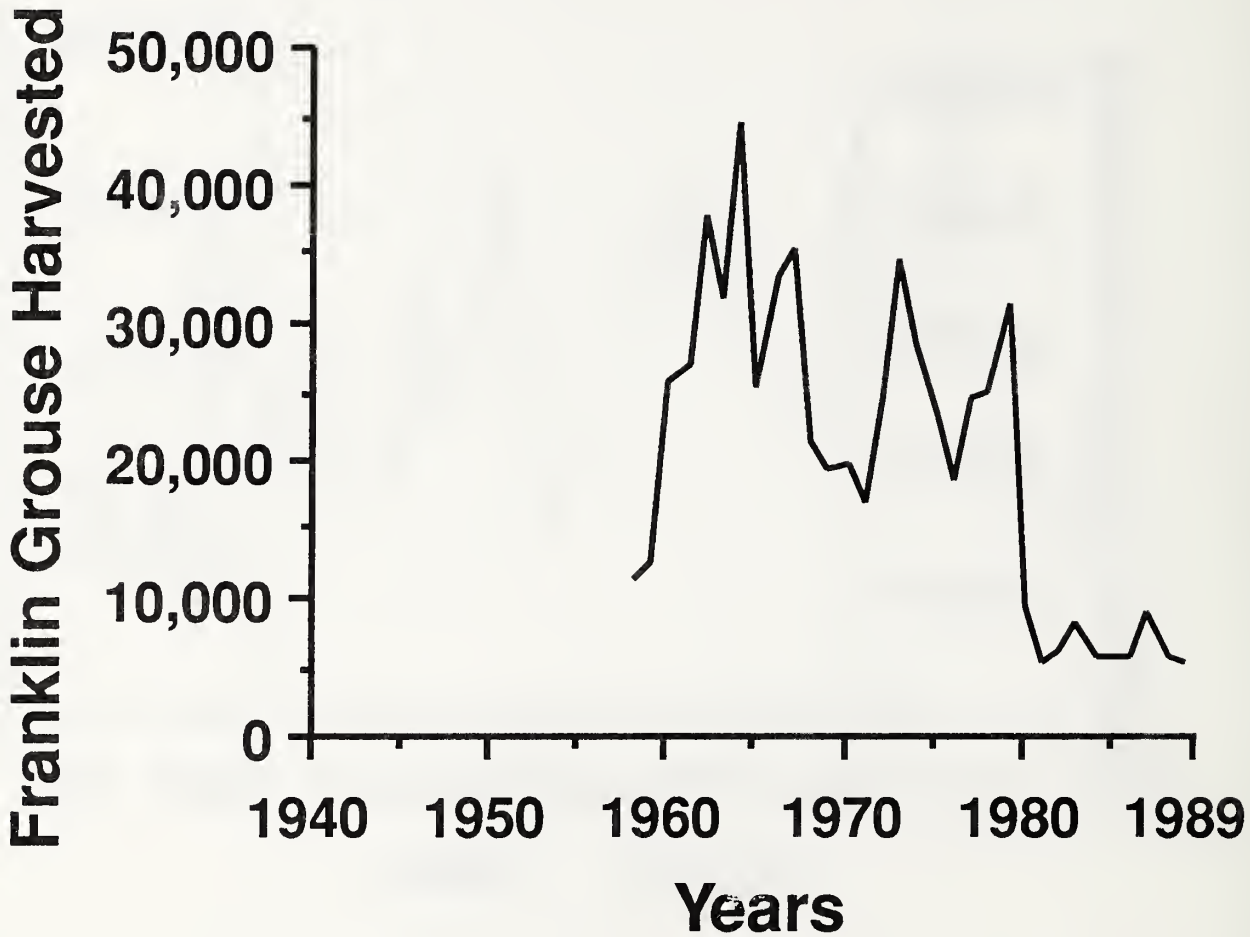


Figure 3. Spruce (Franklin's) grouse harvests in Montana; 1958-1989.

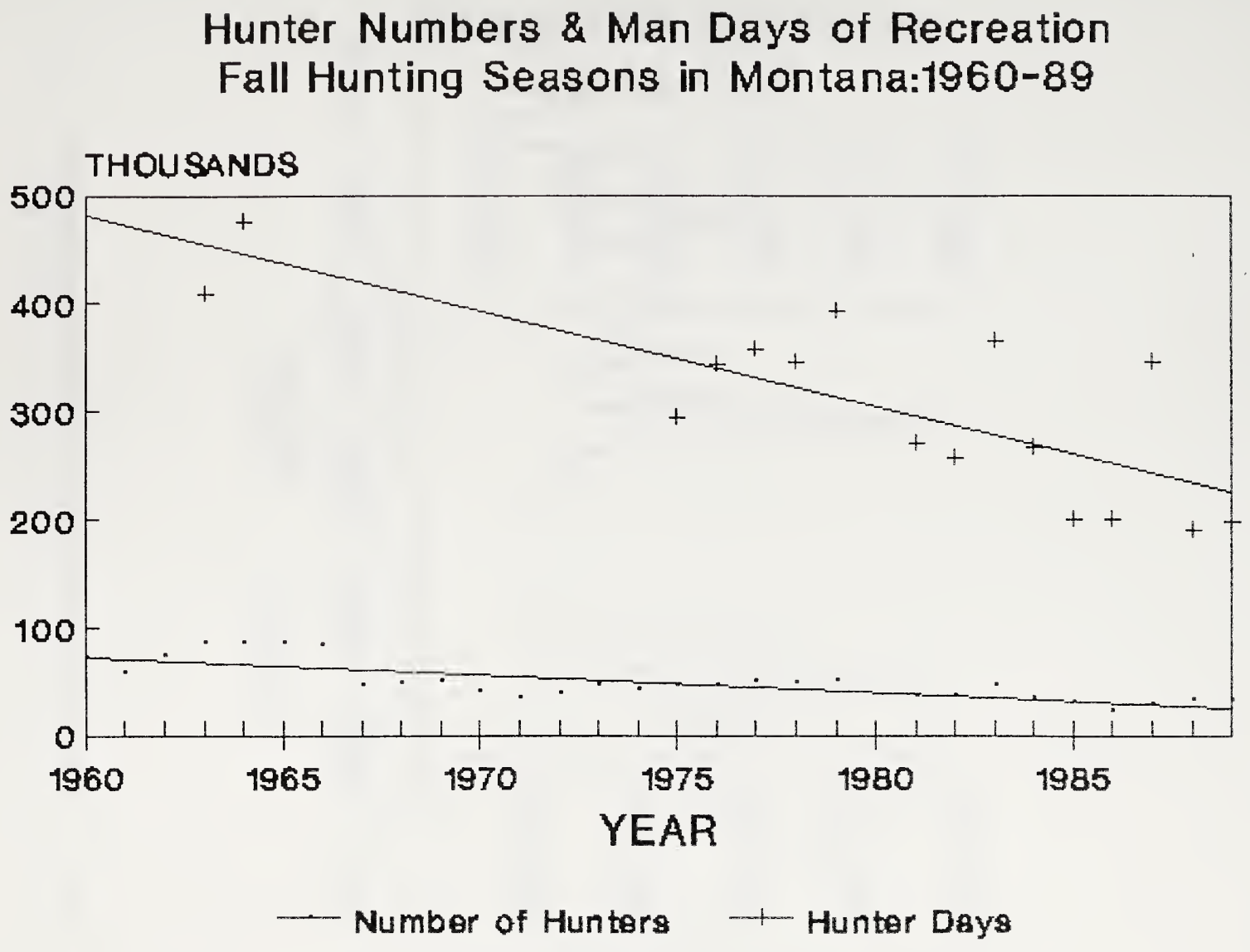


Figure 4. Hunter numbers and man days of recreation during fall hunting seasons in Montana; 1960-1989.

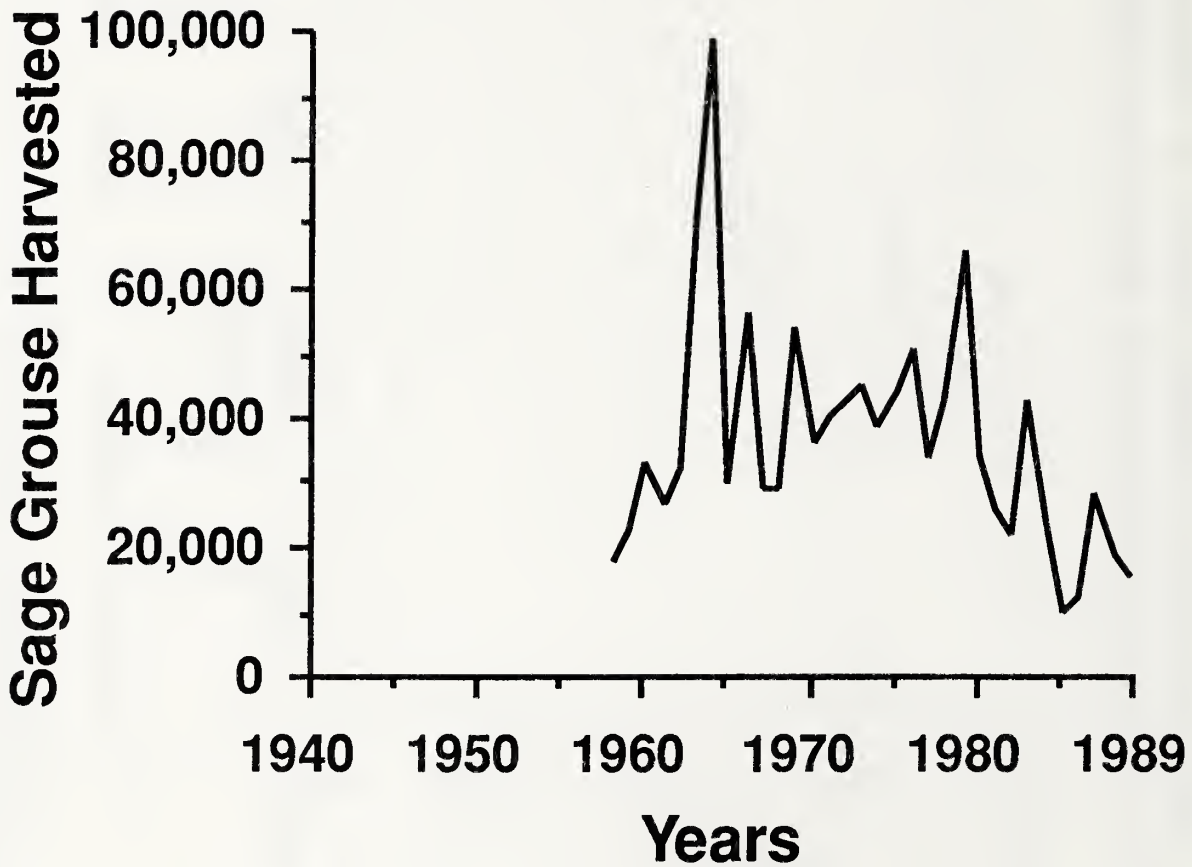


Figure 5. Sage grouse harvests in Montana; 1958-1989.

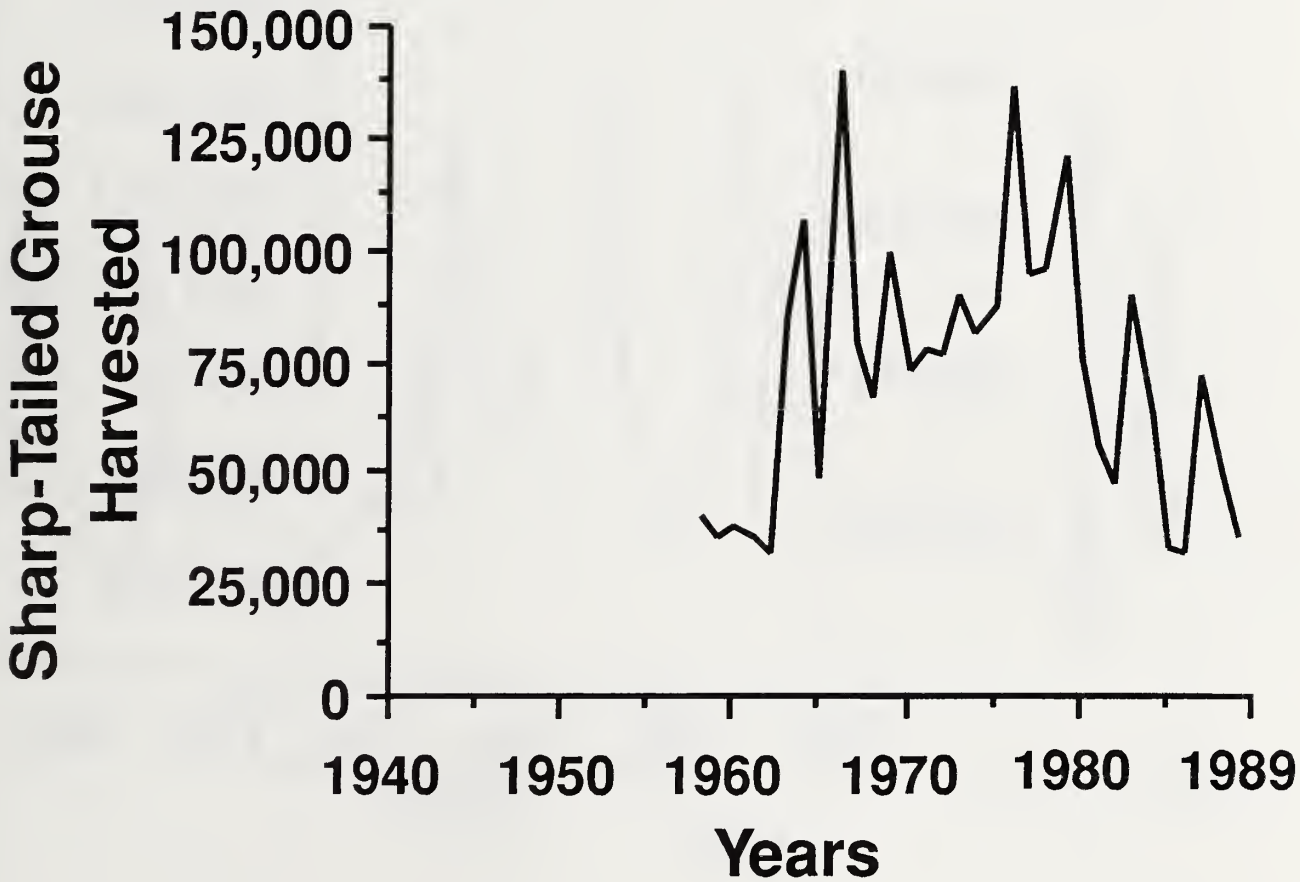


Figure 6. Sharp-tailed grouse harvests in Montana; 1958-1989.

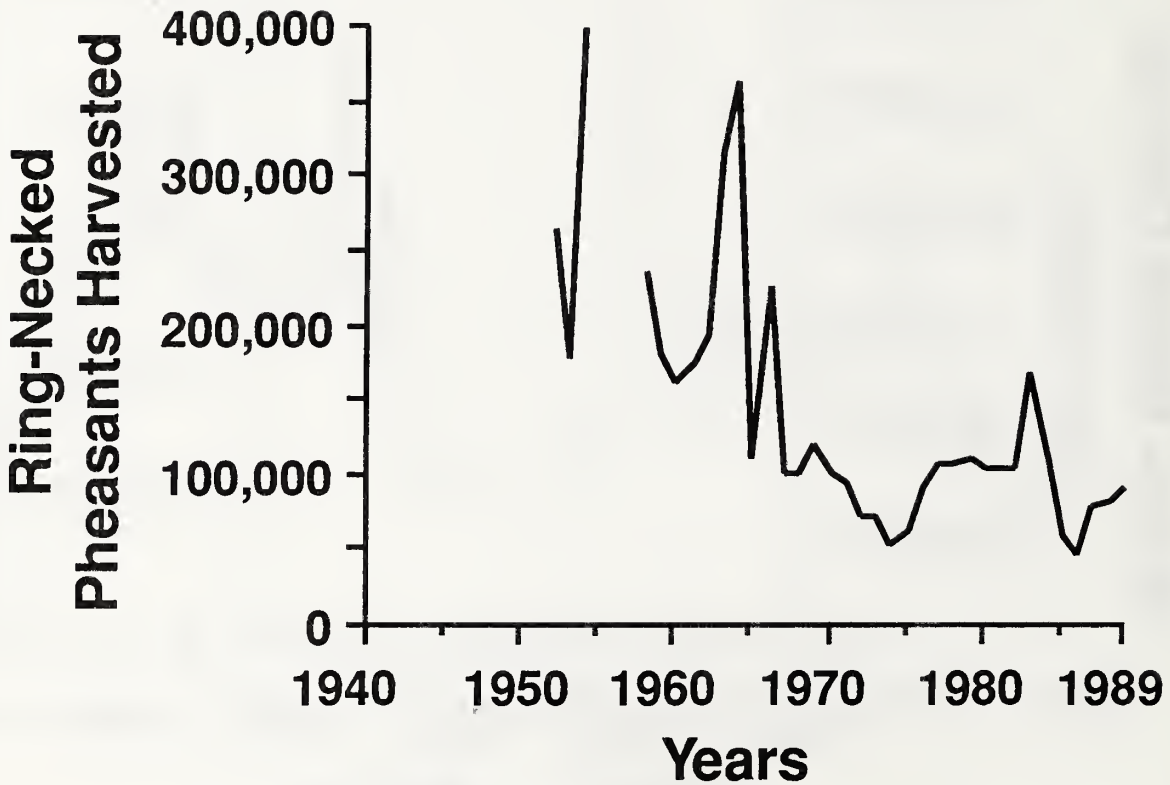


Figure 7. Ring-necked pheasant harvests in Montana; 1952-1989 (excluding 1955 - 1957).

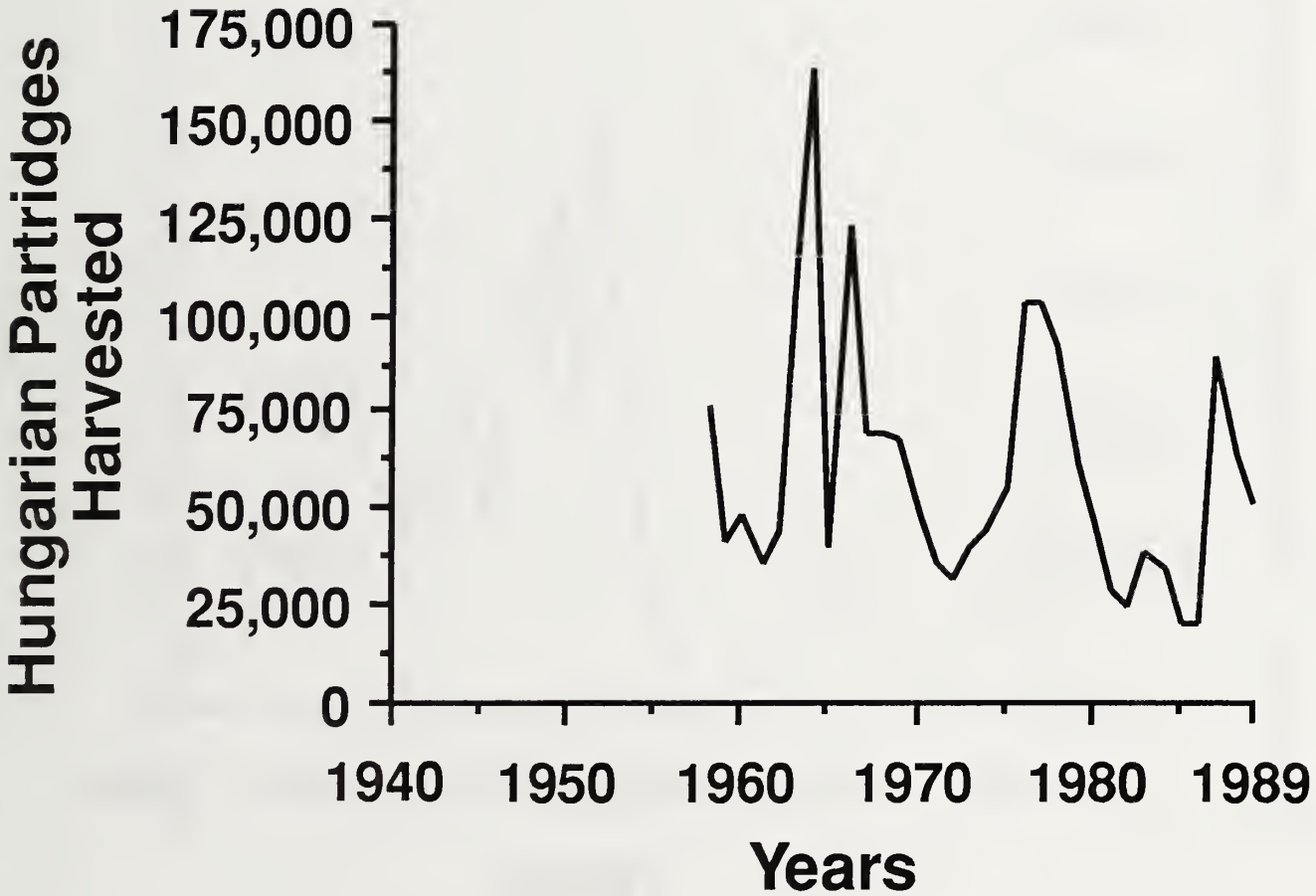


Figure 8. Hungarian partridge harvests in Montana; 1958-1989.

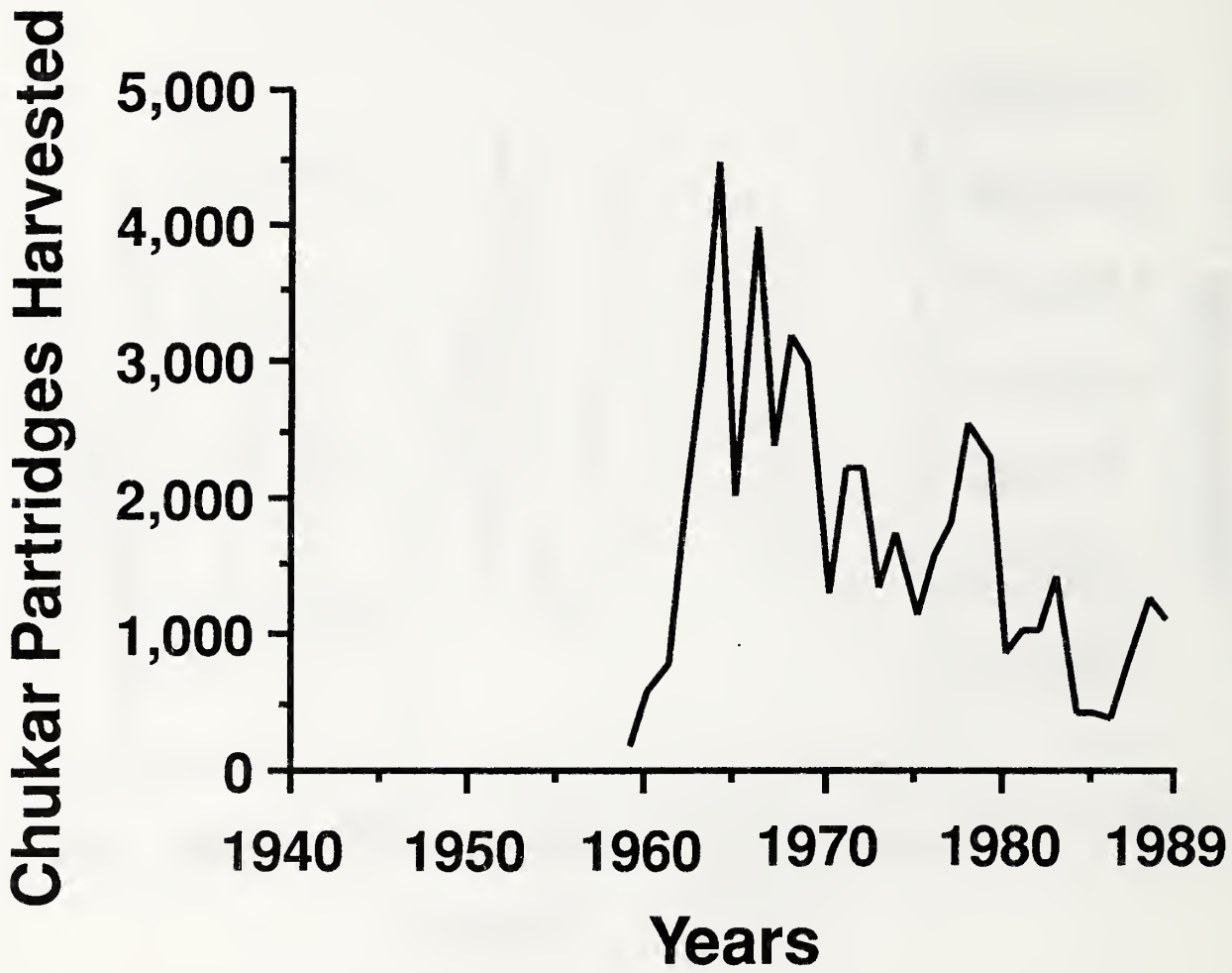


Figure 9. Chukar partridge harvests in Montana; 1959-1989.

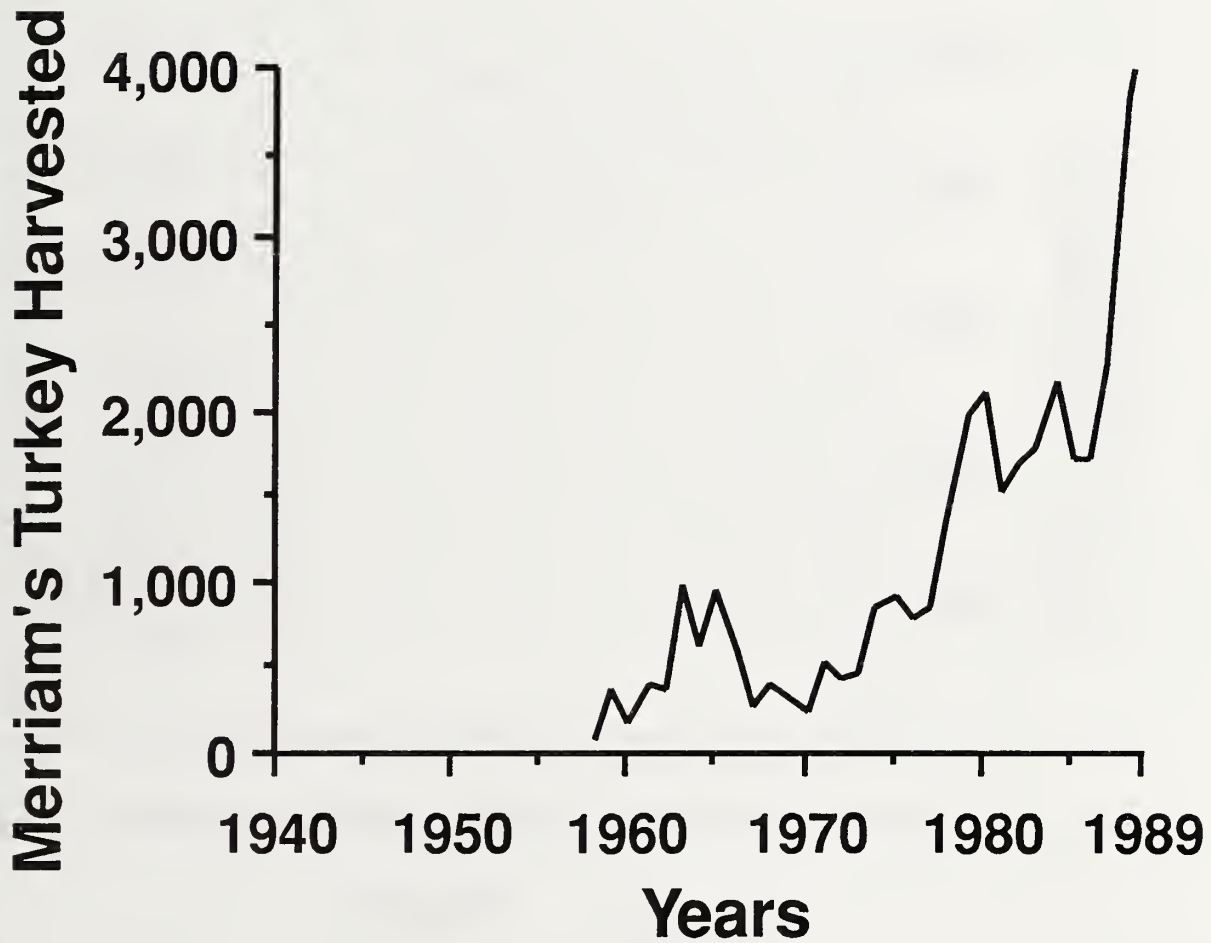


Figure 10. Merriam's turkey harvests in Montana; 1958-1989.

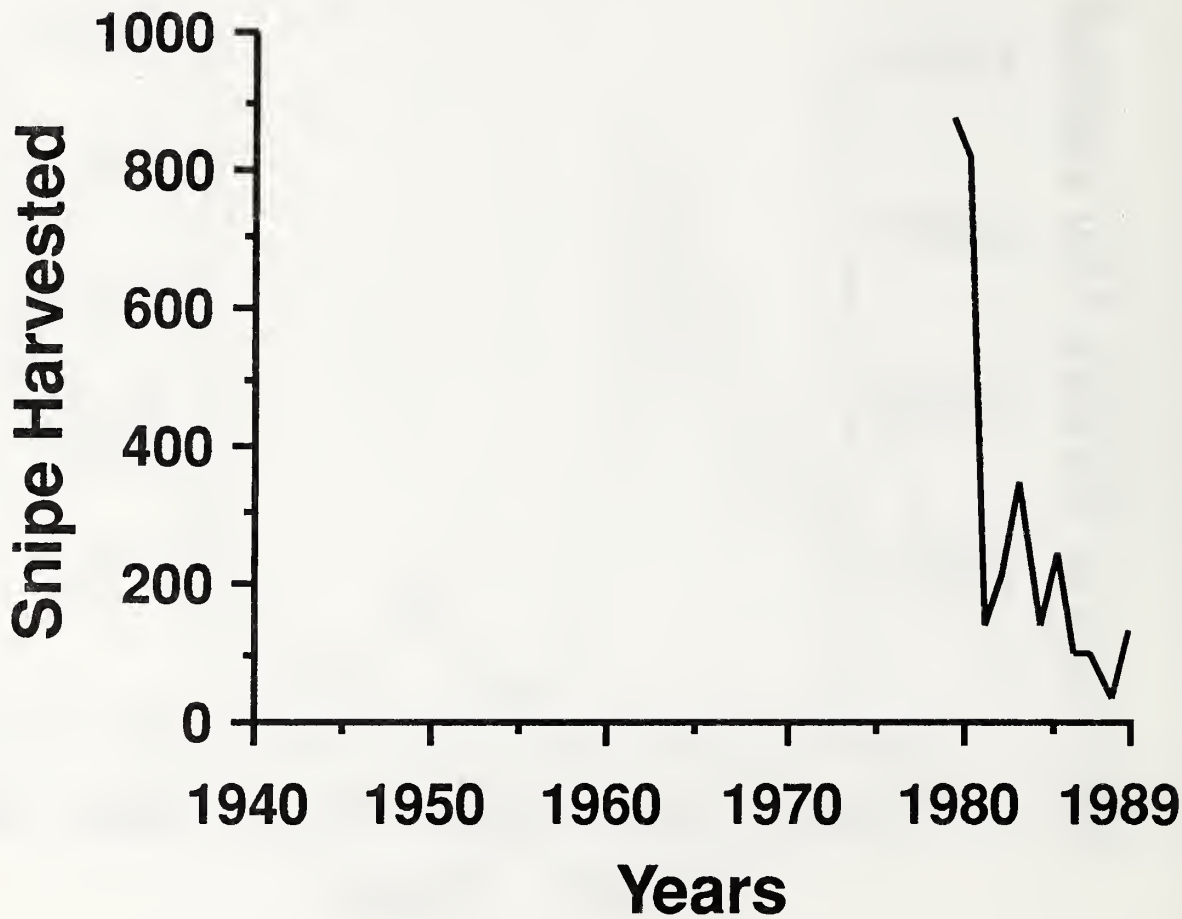


Figure 11. Common snipe harvests in Montana; 1979-1989.

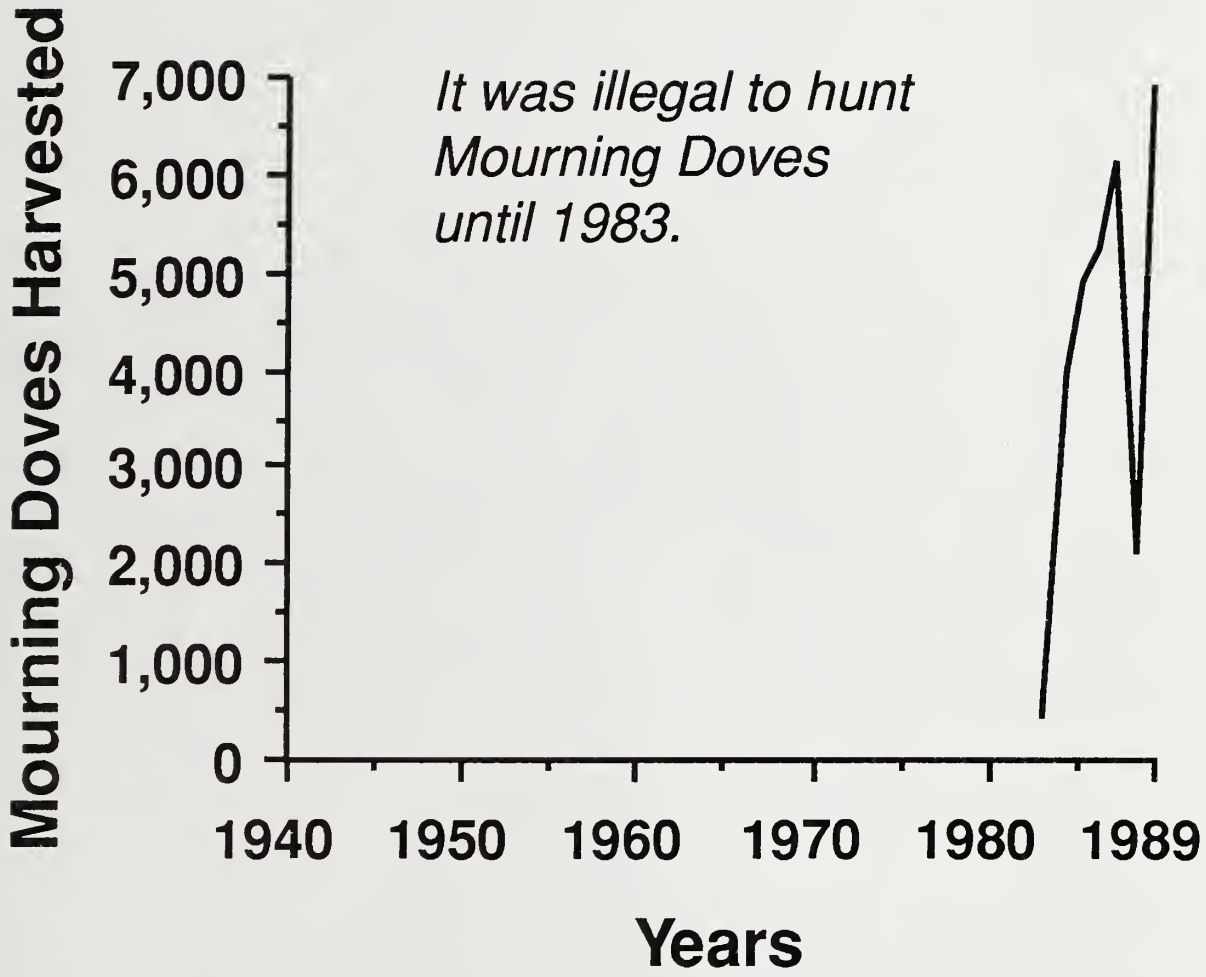
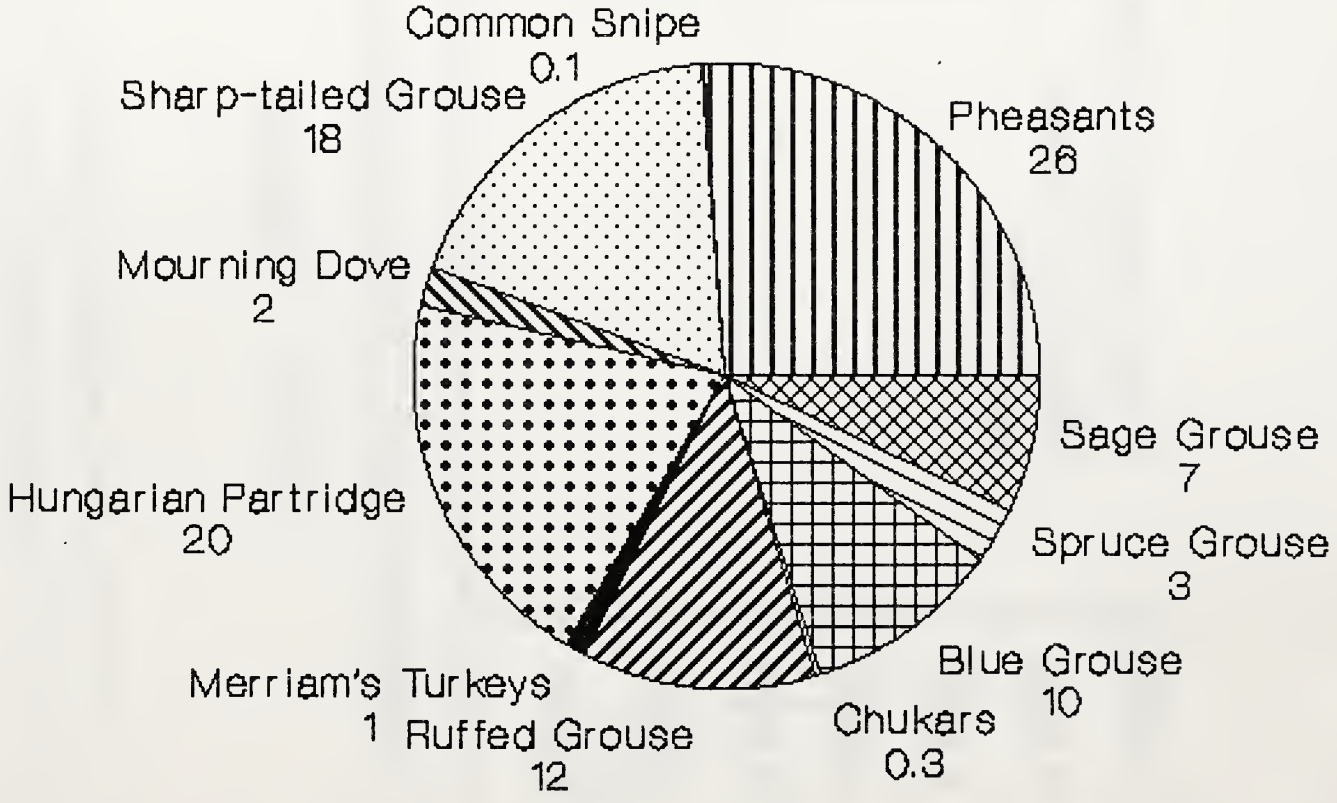


Figure 12. Mourning dove harvests in Montana; 1983-1989.

Figure 13. Composition of the Upland Bird Harvest in Montana: 1985-1989



(Species composition (1% is shown as 0%)

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